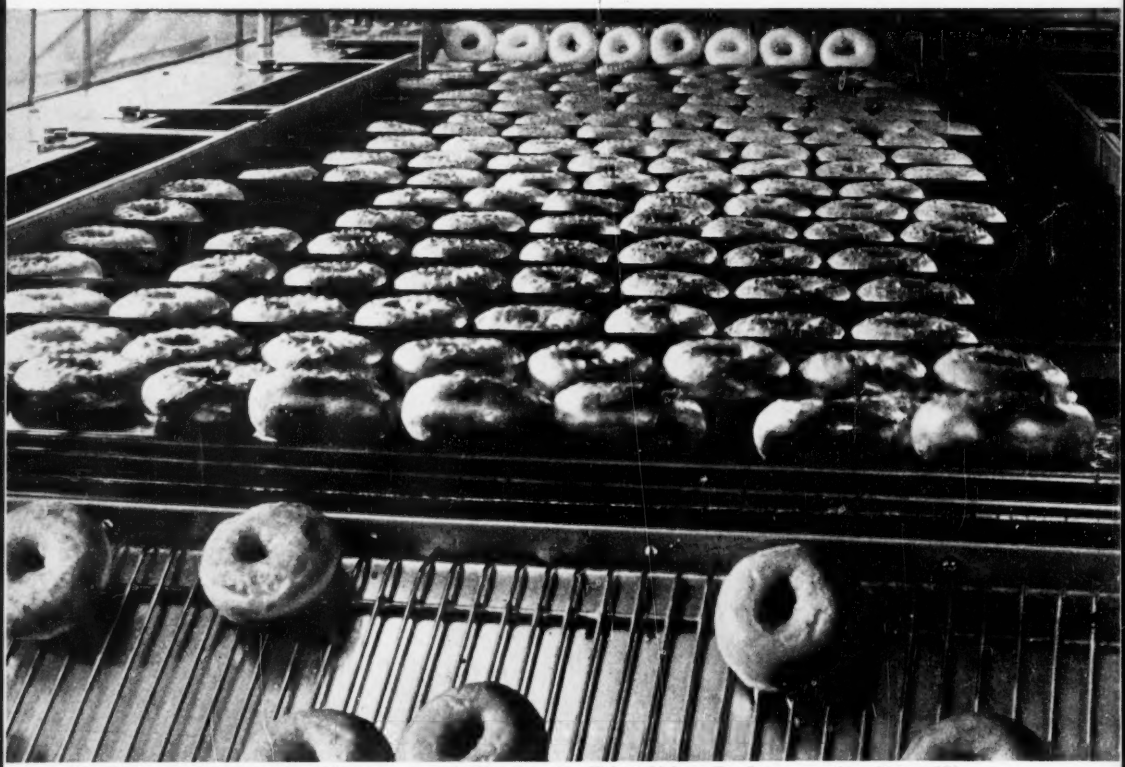
JANUARY, 1951

Food Industries

For those who control quality and costs through management and production—a McGraw-Hill publication



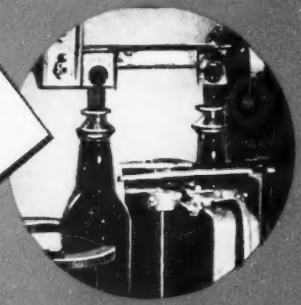
Doughnuts pass through continuous fryer at rate of 8,400 an hour in efficient, high-quality Omar operation. (See p. 55)

YOUR MOBILIZATION PROBLEMS, Silicones speed processes, Model research, Engineering doubles production, Citrus juice report and flowsheet

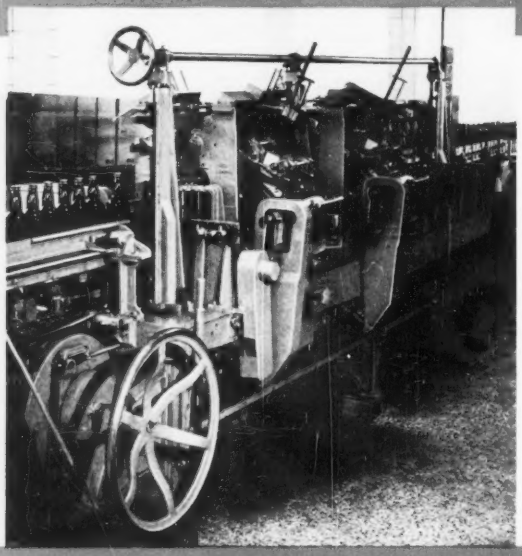
Exclusive "Walking Beam" Feature on

WORLD BEE-LINE LABELERS

HOLDS BOTTLES FIRMLY



FOR *Precision* LABELING



There's no better method of holding a bottle for precision labeling—any bottle, jar or jug, any shape, any size from 2 to 13 inches high—than this rigid, one-piece "Walking Beam" on the BEE-LINE. "Walking Beam" is an exclusive WORLD feature, engineered to pick up bottles directly from the conveyor at the feed end...to hold them firmly...and to deposit them directly onto the discharge chain without any other mechanical means of transfer. Inverted grips do the job (see inset above). They're designed to automatically center or re-center each bottle, allowing for variations in uniformity, and to hold it with a constant gripping pressure as it feeds smoothly and with continuous precision through each station of the machine. Thus BEE-LINE accurately position-controls all bottles, accurately registers all labels—body, neck, shoulder and medallions—at the rate of 2 or more per second, and faster.

"YOU GET THE BEST LABELERS IN THE WORLD"

ECONOMIC MACHINERY COMPANY
WORCESTER 3, MASSACHUSETTS
DIVISION OF GEO. J. MEYER MANUFACTURING CO.
MILWAUKEE, WISCONSIN

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HOW TO USE POSTCARD

Circle numbers of items you want to know more about; fill in your name and address; drop in mail (no postage required). We will tell companies what you are interested in and they reply direct to you.

TO MAKE IT HANDY

Products and literature in this issue are listed on these pages. There are three indexes: (1) editorial items on new equipment, new supplies, new literature; (2) products advertised; (3) advertisers.

WHAT THE NUMBERS MEAN

Advertisements: There is a page number on the postcard for each advertisement. Before the number may appear, L, R, T, B (left, right, top, bottom) locating the ad on the page; small letters following (a, b, c) indicate additional products in the advertisement.

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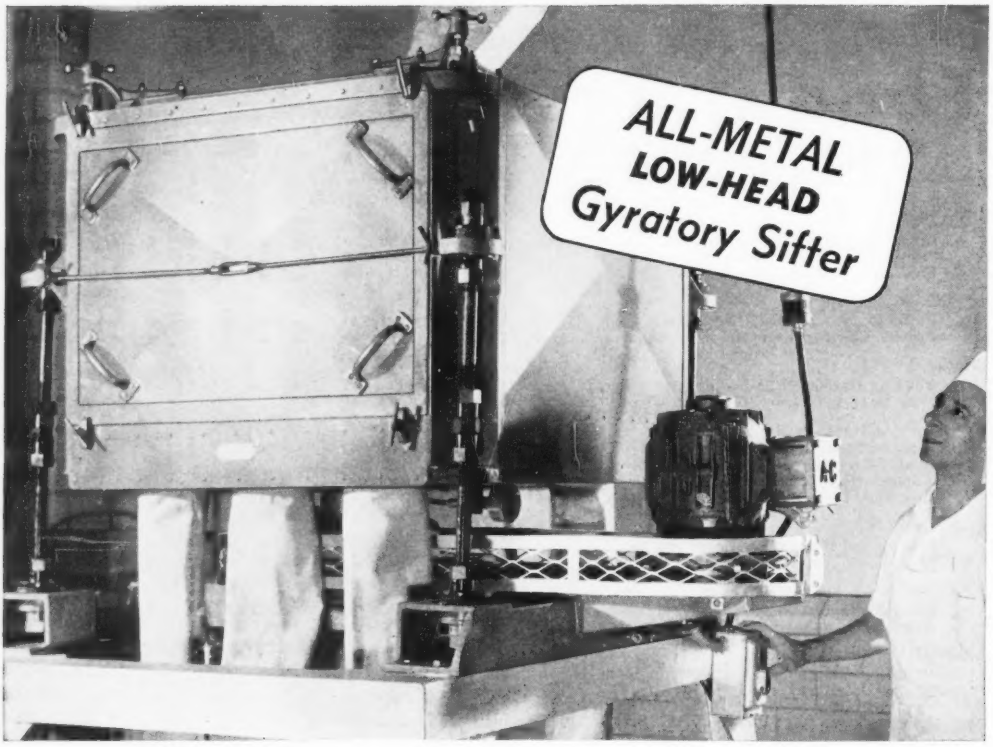

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Low-Head design provides for easy installation . . . needs little floor space.

VERSATILE!

Handles flour, sugar, starch, nut meats . . . hot or cold dry products.

HIGH CAPACITY!

Sifter's high speed operation contributes to large production capacity.

ALL-METAL!

Made of magnesium and steel for long, dependable operation and easy cleaning.

ALL-METAL MACHINE HELPS INDUSTRY MEET NEW PURE FOOD STANDARDS

HERE'S A NEW gyratory sifter that fits perfectly into the modernization picture of *any* food industry plant. It's the all-metal *Low-Head* sifter — made of steel and magnesium, with silk or wire screens.

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Serving the Food Industry for 103 Years

HIGHLIGHTS

Critical materials for all branches of the food industry are to be obtained through Production & Marketing Administration, USDA, which will act as "claiming agent" during the emergency. (News)

Frozen food packers will now be able to fill at the rate of 225 packages per minute on free flowing items, such as peas, mixed vegetables, and lima beans, with a recently developed high-speed automatic packaging operation. Employed is a new end-fill carton in combination with a specially built machine. (New Equipment)

There was an increase of 31 percent in the amount of food plant construction in the first nine months of 1950, as indicated by total value of contracts let for jobs of $68,000 or more. Construction reported amounted to $98,000,000 in the first three quarters of the year, compared to $99,693,000 for all of 1949. And it is estimated that unreported contracts would double these figures.

Studies on frozen peas, beans and corn indicate no real relation between quality of product and organisms present in the raw material. To maintain average sanitary operating conditions, however, the bacterial count should be no higher than 50,000 per gram. (News)

Florida producers forecast production of 40,000,000 gal. of orange concentrate in 1951; California, 6,000,000 gal. Output in 1950 was 21,647,000 gal. for Florida, about 2,000,000 gal. for California. (News)

Greater recovery of sugar from juice—5 to 8 percent more—is reported for new clarifying process, which employs a powder compound and filters in place of the milk of lime used universally since 1685. Additional operating economies are also noted for the new process, which is now in continuous commercial operation at Grove Farm Co.'s Koloa Mill in Hawaii. (Pg. 58)

Water content of purees and concentrated fruit products can now be accurately determined in hours instead of days by a new test that employs a drying agent. Developed at WRRL, this absorption method is hailed as an improvement over the conventional, time-consuming oven technic. (Pg. 85)

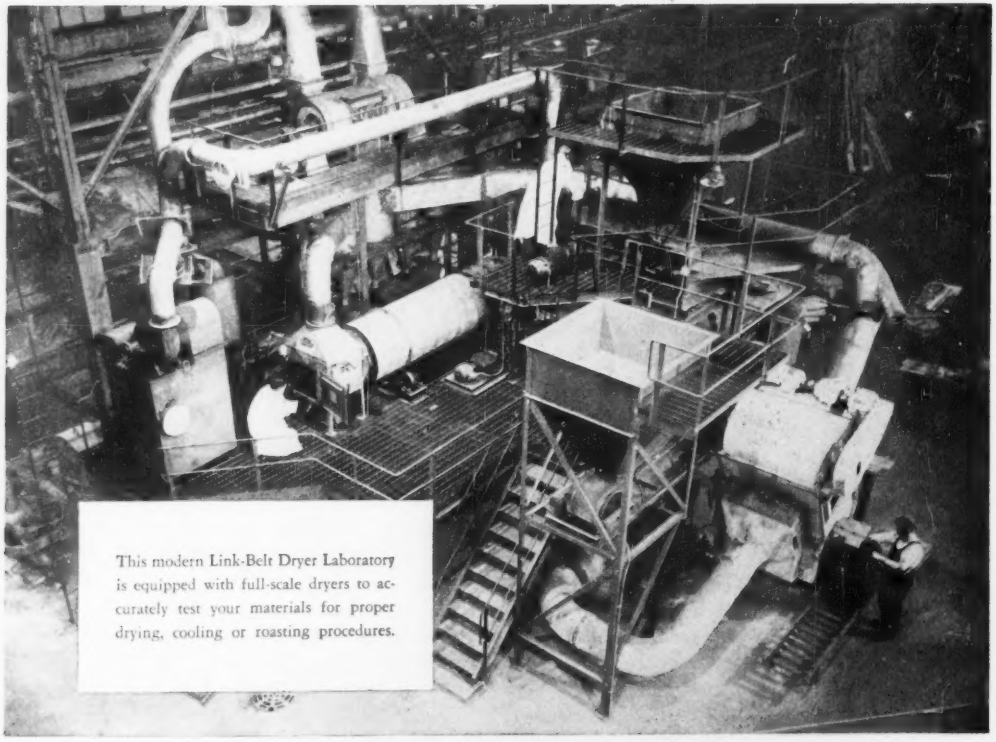
Use of chemicals in foods will be specifically regulated if proposed amendments to the FD&C Act are adopted. They were offered by Deputy Commissioner C. W. Crawford, F&DA, and define as well as limit food additives. (Pg. 50)

Nitrogen, at relatively low pressure, is now being used to "pressure pack" Chase & Sanborn coffee. It's claimed to eliminate cooling-off period from roaster to can, thus preserving fresh flavor. Injecting and sealing machine is specially designed. (Pg. 116)

Unique all stainless steel centrifugal liquefier employs a rapidly revolving disk through which latent heat of steam is transferred to material being liquefied. It's for such frozen products as chocolate, butter, cream, and eggs, producing up to 5,000 lb. an hour. Designed for quick sanitation, all parts can be quickly exposed for thorough cleaning. (New Equipment)

An invitation to manufacturers with

Drying, Cooling or Roasting Problems



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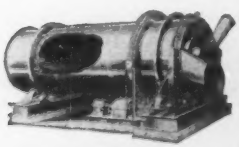
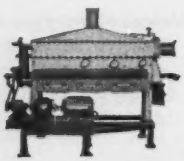




The Talk of the Industry

Price Props Falling

Gradually, Secretary Brannan is dropping food commodity price supports. Hogs, poultry, potatoes, and several other commodities, have been withdrawn from the support program. With December, the price support program for eggs ended.

This reflects the growing dislike by the general public, and the Congressional desire to free more commodities to seek natural price levels.

It certainly will not make food processors mad to be able to buy raw materials at supply-and-demand prices.

Consumers Will Eat More Taxes

No matter how Congress decides to get the 4 or 5 more billion dollars in added taxes, part of the total will find its way into the cost of food products. This suggests the desirability, almost the necessity, of making it clear to the housewife what part of the market-basket price represents taxes.

One of the big chemical companies recently tried to spotlight this for a wide variety of commodities purchased for every home. It pointed out that the price of a quart of milk includes 8 cents in taxes; a loaf of bread, 5 cents; and a typical pound of meat, 20 cents.

Taxes are expensive eating, and not very nutritious.

Something To Keep an Eye On

In August, we pointed to the feasibility of producing a nonfrozen concentrated milk. In November, such a product went on the market in Wilmington, Del. So its technical feasibility is proved. And the dairy industry now is watching consumer acceptance closely to determine sales potentials.

We hear that the product is selling well in stores, but is not doing as good on home-delivery routes.

It is a fair bet, however, that concentrated fresh milk is a product with a future.

Short-Time Retorting Pays Off

Centrifugal agitation of "fluid" canned foods during retorting to speed heat transfer is proving its merit. For one thing, it has made possible the sterilization of fresh milk in No. 10 cans for shipment from the Northwest to Alaska. Retorting in the big cans takes only 4 minutes at high temperature and does not appreciably change the quality of the milk.

This method also offers canners a means of producing several types of canned foods with better texture and vitamin content, particularly when the larger can sizes are used.

A little advanced food engineering often turns out to be one of those tremendous trifles.

Progress Must Be Planned

Because the management feels that progress must be planned and cannot be left to chance, National Biscuit Co. is making a project of mechanical development. It has set up a division with no operating responsibilities. Its job is to develop better and more efficient processing procedures.

And this is more than just a plan. Since the war, the company has spent $60 million on new plants and equipment, and it will spend a like amount in the next five years.

If we were competing with National Biscuit, we would be a little worried if our modernization plans were not of considerable magnitude.

Dries Foods Without Heat

Remember Socrates Kaloyeras? He is the Louisiana State technologist who developed a dehydro-freezing method for preserving eggs in the shell. Now he is developing another new process under a grant from the Quartermaster Food & Container Institute. It is dehydration of foods without heat.

With his method, air at room temperature is recirculated over the product and through a desiccant. In other words, capacity of the air to pick up moisture is obtained by drying the air rather than heating it. The idea is to get better quality by eliminating heat.

For the sake of soldiers who must eat dehydrated foods, we hope the experiment has a happy ending.

Sign of the Times

"The orange juice we serve for breakfast IS NOT FROZEN orange juice." So boasts the printing on a Chock Full O'Nuts counter doily used in New York.

California, you have a friend!

Hors d'Oeuvres

■ Roosters in the hen house during the off-breeding season can be useful, *Farm Journal* tells us. Farmer in Connecticut puts one in a grain bag, in each corner, when he wants to catch the hens for vaccination, blood letting, and the like. Roosters raise such a ruckus, the hens keep clear of corners where they might smother. Probably wouldn't work at a bargain counter, though.

■ Fifty girls staged a walkout at a North Ireland bakery, the *Wall Street Journal* tells us, because the boss wouldn't let them sing. But they are back at work now. Boss said they could hum. This leaves the Russians standing alone in refusing to compromise on anything.

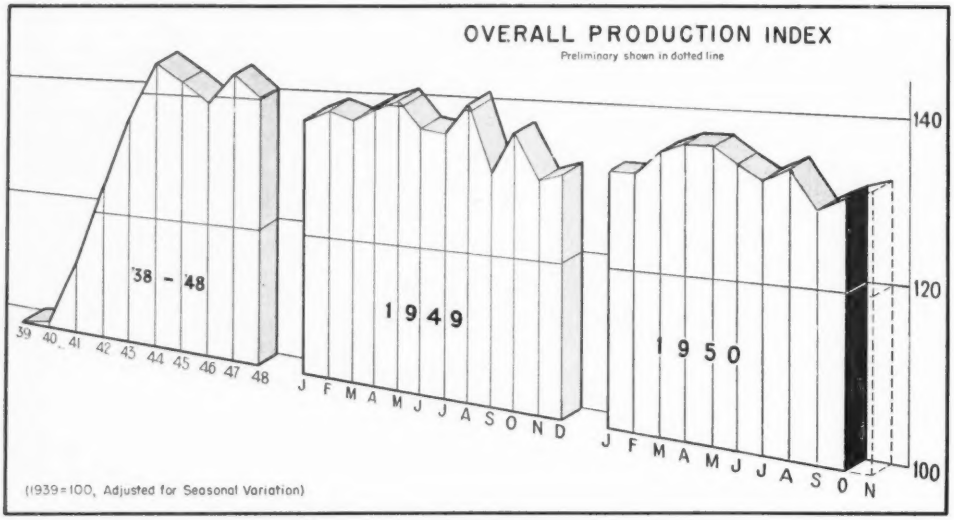
■ WCTU prexy, confusing beer with intoxicating beverages, scolds Columbia U. for tying in with Schlitz to present Pulitzer Prize plays on TV. She says the programs are "obviously put on by the brewer to promote drinking in the American home." No, no, lady! Any home will do, and they promote only the drinking of Schlitz.

■ And the brewing industry concludes that it is the lingering bad taste of home brew that has caused per capita consumption of beer to drop from 21 gal. in 1913 to the present 17 gal. Lingering echo of a dime in the bucket might have something to do with it, too.

■ Along with—but not related to—the news that crunchless popcorn is actually in production, comes the pharmaceutical shipper who uses the stuff (either kind) in place of shredded paper as a cheaper and lighter filler in packaging. Okay! But from now on we cast a fishy eye on popcorn served up in drug stores.

J.A.J.J.

FI Index and Outlook


OVERALL PRODUCTION INDEX
Preliminary shown in dotted line
140
120
100
'38 - '48
39 40 41 42 43 44 45 46 47 48
1949
J F M A M J J A S O N D
1950
J F M A M J J A S O N
(1939=100, Adjusted for Seasonal Variation)

Income Rise, Cutback in Durables Point to More Food Sales in '51

But small inventories currently on hand may tighten supply . . . Bakery production gaining already

SALES will be no problem for the food industry generally in 1951. That's clear from the figures recently released on consumer income and spending. In the third quarter of 1950, consumer income reached an annual rate of over $200 billion. And nearly all of it was spent. Less than 5 percent was saved, compared with 7.5 percent in 1949. These are small percentages. But they add up to a lot of business when the figures are in billions of dollars.

Personal income is still rising. It will soon be higher than in the early months of 1950, when the GI dividend was being paid. Even if people save a little more, they will have enough for increased spending. And significantly for the food industry, the fastest rising incomes are those of industrial workers. In the past, bigger paychecks for these workers have always brought a sharp uptrend in food sales.

Food producers will also be favored by the reduced availability of consumer durable goods in 1951. This is now a near-term prospect. Cutbacks in output of automobiles, electric appliances and other home furnishings and in the construction of new homes will be effective by mid-year. For the past year, an abnormally large share of consumer income has been going into the purchase of these durable items.

This may continue in the early months of 1951, before production restrictions become too severe, and while stocks of hard goods are still available. But by summer people will find fewer durables in the stores. And spending on soft goods should pick up rapidly.

In the food field, one of the likely developments is an increase in restaurant business. Eating out was one of the favorite ways for spending extra dollars during World War II. Another sure trend is toward the higher priced foods which offer the consumer more quality, variety or convenience.

Supply Picture Not So Bright

On the supply side, there is not much that can be done before next fall's harvest. We are in a period when a good share of the nation's food supply must come out of inventories. And inventories look small compared to the prospective increase in sales, although in some cases they are higher than last year.

For example, total packer and wholesale distributor inventories of canned fruits were slightly smaller on Nov. 1, 1950 than on the corresponding date in 1949. Combined inventories of fruit juices were about a third higher. But stocks of canned vegetables were probably not more than 15 percent over the 1949 figure. Inventories of all canned items at the start of the New Year may be less than 10 percent above those held on Jan. 1, 1950. Stocks of meat in cold

At a Glance—

(1939 = 100, with all figures adjusted for seasonal variation.)

	Oct. 1950	Sept. 1950	Percent Change	Year Ago
Baking	124	124	0	127
Butter	69	73	−5	87
Canning	155	140	+11	152
Cheese	158	163	−3	159
Confectionery	133	147	−10	143
Evap. Milk	149	141	+6	124
Flour	103	106	−3	115
Ice Cream	190	168	+13	175
Malt Liquors	140	182	−23	117
Margarine	252	274	−8	257
Meat	149	150	−1	147
Sugar	92	102	−10	94

storage were less than 10 percent above 1949 holdings on Nov. 1.

It seems more than likely that by spring supplies of both meats and canned goods will be very tight, particularly if military buying steps up.

Current output of processed food is rising gradually. The FI index for November (preliminary) was 133, compared with 132 (final) for October. And some further gains are likely. But really large gains in production cannot be achieved until new crops improve the supply of raw foodstuffs.

Bakery Sales On Upswing

A definite uptrend has started in sales of bakery products. Sales of virtually all items improved in the second half of 1950. Sweet goods were reported up 10 to 15 percent. Bread sales, which account for well over 50 percent of the total baking business, started turning higher.

Early in the year, bread sales were off from 5 to 15 percent, compared with 1949 in various parts of the country. But in December some companies reported monthly sales gaining over 1949. And others indicated volume had at least reached the previous year's figure.

Cakes, pies, and other sweet items showed drops of 5 to 10 percent below 1949 up to June. But by September, the movement of these products had gained as much as 10 percent over the previous year. And high volume sales are continuing.

Three factors account for this reversal of trend:

1. Higher consumer income has boosted the demand for sweet goods.

2. The return of many women to industrial jobs has left them with less time for baking at home. At the same time, their higher income encourages buying commercially made cakes, pies and other products. One of the biggest reasons for the drop in bakery sales after 1947 was increased home baking. Women were spending more time at home. They had less extra cash to spend. And home baking was stimulated by the sale of prepared cake mixes. The cake mix business jumped 150 percent in 1947–49. Now it seems the trend is back toward buying cake in stores.

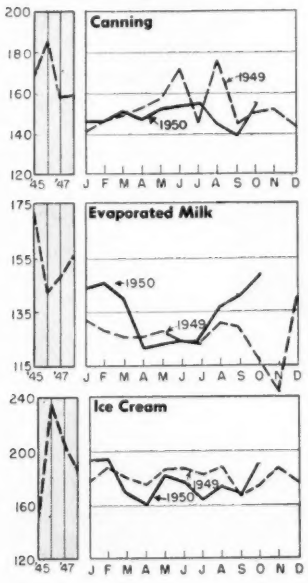
3. The industry has put on a strong advertising and sales program. This has been particularly important in raising the demand for bread, an item which had been declining in popularity compared to other foods.

Big Sales Campaign

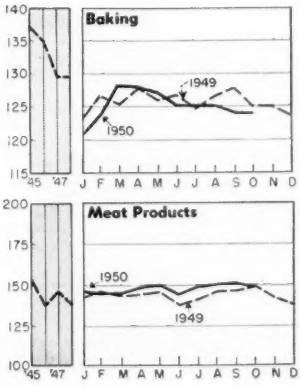
A $2,000,000 two-year advertising, merchandising and general promotion campaign was launched last spring. National advertising emphasized "Bread—your best food buy," and also the home labor saved by other bakery products. The major promotion for 1951 will feature the increased value of bread in the diet brought about by bread enrichment. Bakers claim that testimonials received from big names in medicine and nutrition amount to the greatest advertising endorsement ever given any food product.

An overall increase in bakery production is clearly in sight. Bakers have indicated their own estimate by asking for a sugar quota 15 percent greater than in 1950.

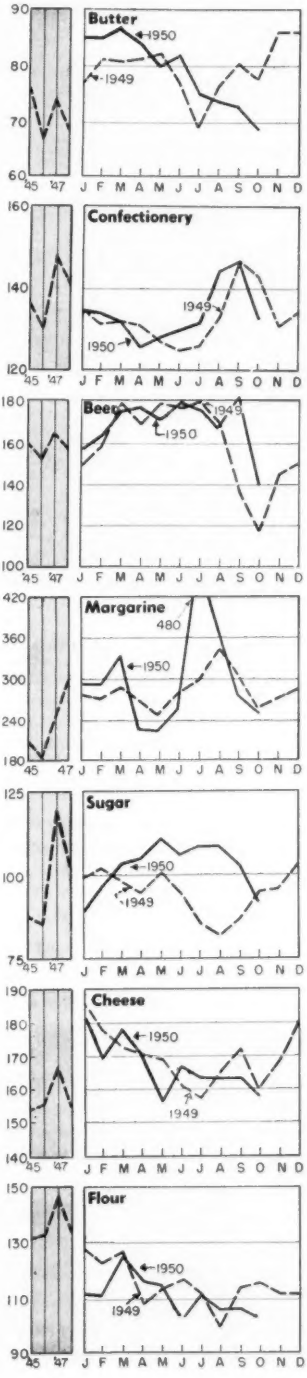
RISING ▲



STEADY →



FALLING ▼



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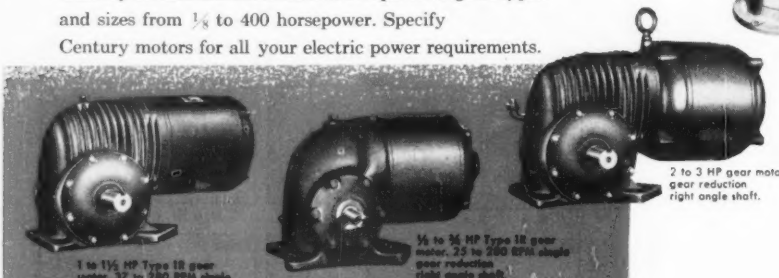

2 to 3 HP gear motor. Single gear reduction right angle shaft.

1 to 1½ HP Type 1R gear motor. 37 to 280 RPM single gear reduction right angle shaft.

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What Washington Thinks

MANPOWER HEADACHES—Plant workers will be scarce from now on. The talk about getting all the boys home from Korea for Christmas may have been comforting to mothers during Thanksgiving week. But it was wholly unrealistic. There will be more men in uniform during 1951 than at any time in the past five years.

NEW CONGRESS—It takes several weeks to get a new Congress organized for action. The substantial shift resulting from the November elections will increase the time needed this year. When organized, the new Congress deals with entirely new bills, for all the old ones died with last year. Probably the newest factor in 1951 legislative proceedings will be the question of whether industry can get what it wants despite military planning and procurement. Shortages caused by defense planning are likely to be a much more important management problem than any Fair Deal projects, most of which were discredited on November 7.

WHAT ELECTION "PROVED"—After two months of theorizing regarding what the election proved, the food technologist logically remains skeptical. But there is one generalization which seems perfectly safe. The plan for Congressional reexamination of legislative programs will go far beyond the foreign policy question. A closely divided Congress always approaches new legislation more critically than does one which is strongly either Democratic or Republican. Thus, new enactments are now sure to be conservative in the case of labor and agriculture. There will be some legislation on both subjects, part of it very fundamental. But about the only radical and drastic thing to expect, aside from defense measures, has to do with how big the new tax bill will be. That is likely to be very radical.

SCARCE "STAINLESS"—One of the first pinches on the food technologist interested in new plant equipment is the limitation on the use of columbium-stabilized stainless steel except for military projects. The obvious first effect of that restriction was to limit the amount of available welded stainless-steel machinery. But this is only a first pinch on the equipment man. Arrangements for new facilities must not be delayed any longer than necessary or there may be dozens more such difficulties in getting desired types of equipment.

QUICK GLUTEN TEST—Rapid appraisal of the quality and quantity of gluten in wheat can be had by a swelling test of a water suspension treated with a proper concentration of lactic acid. The new test is recommended by Production & Marketing Administration for grain grading as well as for baker's use.

GILLETTE INQUIRY—Senator Gillette, during the past two or three months, has promised to investigate certain food price spreads between the farm and the market basket. Expected during January is a study of the effect of the government rubber and alcohol programs on the availability and price of sugar. Specifically needing investigation is the effect of large alcohol purchases from the French. The plan will undoubtedly remove much of the Cuban surplus sugar from the market and probably will account for a higher sugar price in 1951 than would otherwise readily have been maintained.

TRANSPORTATION SAFETY—All food establishments struggling with the ICC regulations for transportation by rail, water, and motor vehicle will welcome the newly published up-to-date revisions available in *Federal Register* of December 2. Shortly this same consolidation of rules and regulations will be available in pamphlet form, greatly assisting everyone who has to ship any goods for which packaging, handling or lading is specified. The new regulations are bad enough but much easier to use than the old ones on which there were more amendments than original text.

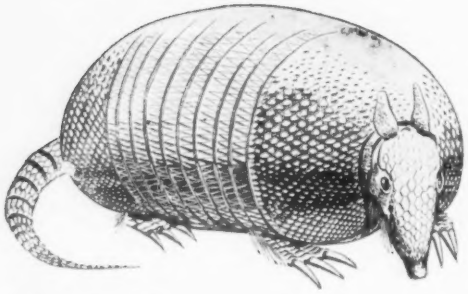
FIG POWDER—"Fig powders have been prepared from commercial dried figs by tunnel, vacuum, and drum drying procedures, and the resulting powders compared. It was found that the minimum amount of heat damage was incurred in vacuum drying, but that drum-drying and tunnel-drying procedures resulted in products considered satisfactory. The latter powders possessed a characteristic fig flavor and, in addition, a slightly caramelized flavor that was considered pleasing. Utilization of fig powder in bakery products is briefly discussed. A colorimetric method for assaying heat damage is described." For more details, see Western Regional Lab's coverage of methods and results in Bureau of Agricultural & Industrial Chemistry Report AIC-283.

WATER POLICY—An elaborate three-volume report is currently available from Water Resources Policy Committee, which reports on present water law, conditions in ten major river basins, and the basic need for more facts on water purity and prevention of pollution. Any food company involved in problems of this sort can profit by a bit of "home work" on these books, shortly to be sold by Superintendent of Documents, Government Printing Office, Washington 25.

BETTER CRATES—Western Growers Association has been working with the Department of Agriculture on reducing transportation loss of vegetables through development of a new crate, which reduces handling damage both to the container and the vegetables. The new "WGA" crate" will cost no more, it is claimed, but will allow increased carloading, reduced refrigeration cost, and less transport damage. Those interested in comparable studies on other containers should address Production & Marketing Administration, Washington 25, D. C.

"EVERYBODY'S BUSINESS"—Public Health Service is publicizing the problem of water supply through a new booklet, *Clean Water Is Everybody's Business.* This is a very effective little document (price, 20c.) for managements that wish to deal with small municipal governments unwilling to do their part in preventing pollution by sewerage. It is also seen helpful with employee groups reluctant to cooperate. The industrial aspect of the job is emphasized. Among other things the booklet points out that "nearly half of the population now lives in 140 metropolitan districts covering only 1½ percent of the total land area of the country. Industrial production has more than doubled since 1935. The amount of polluting matter discharged into streams by communities and industries is equivalent to the untreated sewage from a population of more than 150,000,000 persons, but over half of this is produced by industrial wastes."

—R. S. McBride, Washington, D. C.



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Ice Cream - Milk

FISH - FRUIT - FROZEN FOODS
POULTRY - SHORTENING
VEGETABLE

* A disagreeable-looking member of the order *Edentata*. Lives in burrows in the Southwest where his bony armor plate protects him from reptiles and other enemies.

** One of the most beautiful representatives of *felis domestica*. His splendid coat suggests the long, silky hair of the Angora goat whose tresses usually wind up in textiles.

Kalamazoo Vegetable Parchment Company

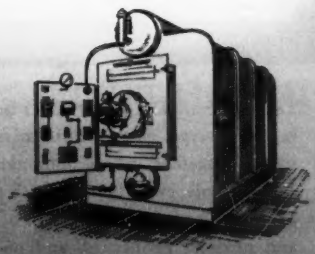
PARCHMENT · MICHIGAN

ASSOCIATED COMPANIES: KALAMAZOO VEGETABLE PARCHMENT CO., DEVON, PENNA.
KVP COMPANY OF TEXAS, HOUSTON, TEXAS
HARVEY PAPER PRODUCTS CO., STURGIS, MICHIGAN
IN CANADA: THE KVP COMPANY LIMITED, ESPANOLA, ONTARIO
APPLEFORD PAPER PRODUCTS LIMITED, HAMILTON, ONTARIO - MONTREAL, QUEBEC

ERIE CITY INTRODUCES

ERIE CITY KEYSTONE STEAM GENERATOR

- A 2-drum water tube boiler + automatic oil and gas burner + induced draft fan + operating and safety controls.
- Gas travels 3 lengths of the boiler—high efficiency with either oil or gas.
- Conservatively rated. Easily cleaned—nationally serviced.
- In 10 standard sizes: 75 thru 800 developed horsepower. Steam working pressure from 160 PSI.



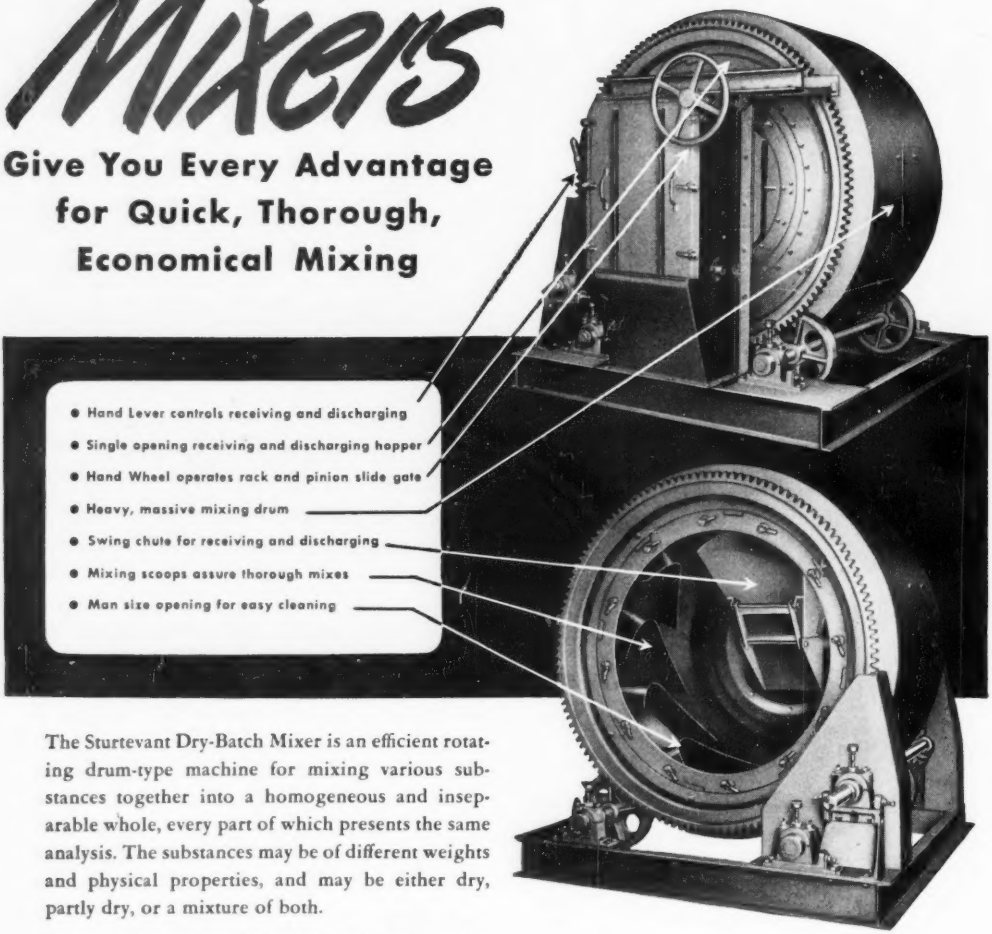
For complete specifications - Write for Bulletin SB-38.

ERIE CITY IRON WORKS *1451 East Ave.* **ERIE, PA.**

Sturtevant Dry Batch

Mixers

Give You Every Advantage for Quick, Thorough, Economical Mixing


• Hand Lever controls receiving and discharging
• Single opening receiving and discharging hopper
• Hand Wheel operates rack and pinion slide gate
• Heavy, massive mixing drum
• Swing chute for receiving and discharging
• Mixing scoops assure thorough mixes
• Man size opening for easy cleaning

The Sturtevant Dry-Batch Mixer is an efficient rotating drum-type machine for mixing various substances together into a homogeneous and inseparable whole, every part of which presents the same analysis. The substances may be of different weights and physical properties, and may be either dry, partly dry, or a mixture of both.

Because of the unique design of its mixing chamber, and the 4-way mixing action which brings two or more substances together, the Sturtevant Dry-Batch Mixer does a more rapid mixing job than other machines and, at the same time, it is complete and thorough in every particular.

Write for bulletin today.

STURTEVANT MILL COMPANY

106 Clayton Street, Boston 22, Mass.

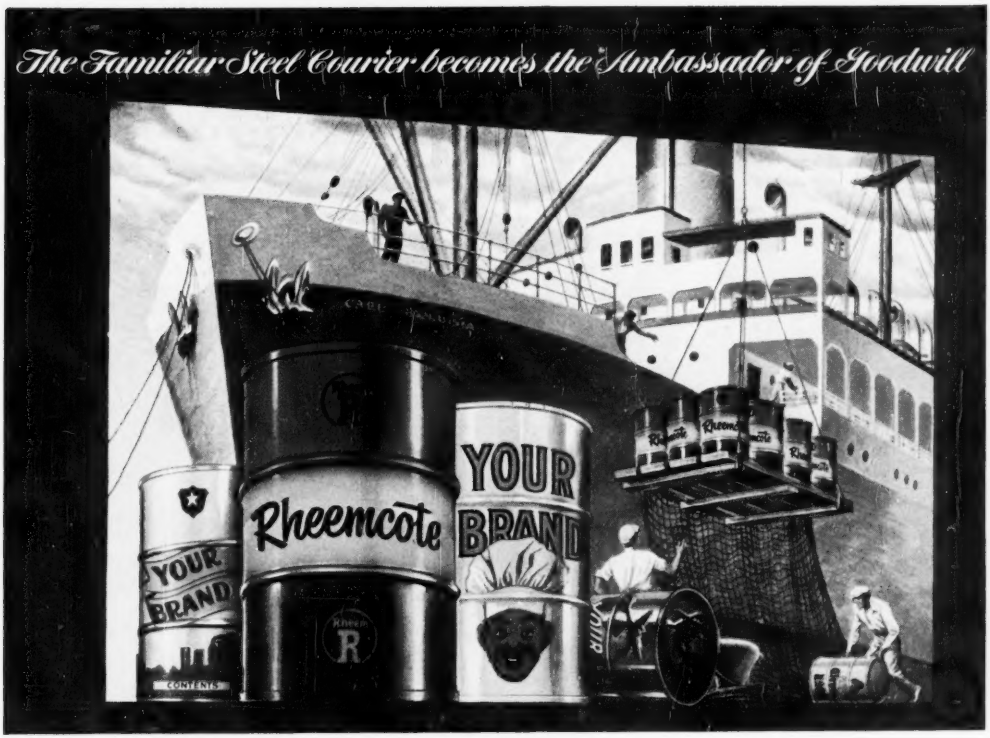
Designers and Manufacturers of:

CRUSHERS • GRINDERS • SEPARATORS • CONVEYORS
ELEVATORS • MIXERS
MECHANICAL DENS and EXCAVATORS

Compare These Advantages

- Only one lever controls both receiving and discharging for simplicity of operation. Hand wheel operates rack and pinion slide at feed opening.
- 4-way mixing action speeds production...assures thorough blends.
- "Open-door" accessibility permits easy, fast, thorough, cleaning.
- Single aperture drum for both intake and discharge.
- Unusually efficient scoops pick up materials to effect thorough mixing as drum revolves.
- 5 models . . . a size for every mixing job . . . smallest size mixes up to 7½ tons per hour . . . largest size up to 75 tons per hour.

The Familiar Steel Courier becomes the Ambassador of Goodwill



NOW! COLOR PACKAGING FOR LARGEST STEEL SHIPPING CONTAINER!

New RHEEMCOTE Process Produces First Completely Lithographed and Inner Roller-Coated 55-Gallon Steel Drum

Color schemes, trademarks and designs, however intricate, may now be accurately reproduced on the biggest of all steel shipping containers.

Striking possibilities of the new, exclusive *Rheemcote* process, as shown above, are the result of years of Rheem research—and development of the world's largest metal-decorating press.

Remarkable for its merchandising value alone, the *Rheemcote* drum not only promotes—*it protects!*

A roller-coated lacquer lining seals the inner drum surface with glass-like purity . . . and thus opens the door to improved packaging for products which heretofore have been difficult to contain. New electric "Resistance" welding produces smooth, strong seams, eliminates scale and burn-off metal. A hard, lustrous, exterior finish assures utmost durability against severe weather and handling.

Users of steel containers may at last achieve uniformity of packaging – and the opportunity to billboard their products and name before the eyes of the world!

The Rheem Manufacturing Company, world's largest maker of steel shipping containers, is particularly proud to have developed the Rheemcote Process in this its 25th year of service to industry.

For a descriptive, beautifully illustrated brochure on this important contribution to marketing—write direct to Rheem today. No cost or obligation, of course.

RHEEM MANUFACTURING COMPANY • 570 LEXINGTON AVENUE, NEW YORK 22, N. Y.
Plants and Affiliates Throughout The World

Rely on Rheem to Deliver Your Goods..and Goodwill

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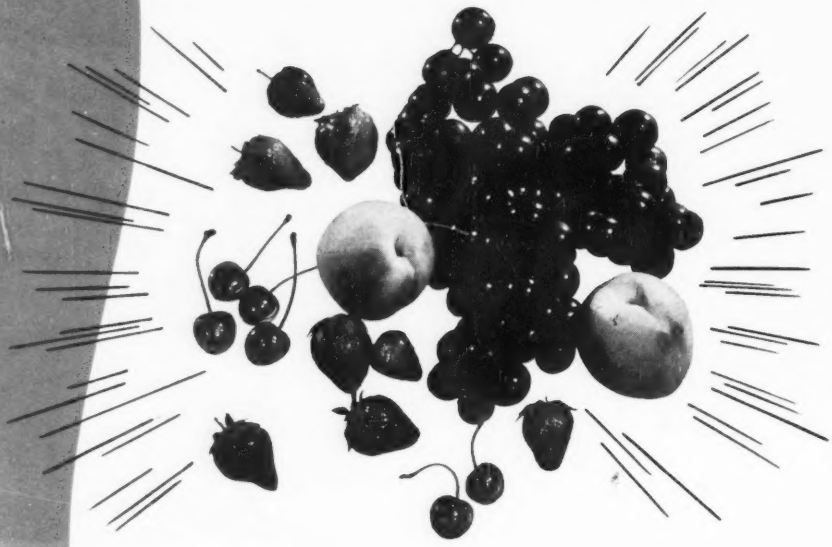
THERE *IS* SOMETHING NEW



IN *TRUE FRUIT* FLAVORS!

By adopting and improving on the new discoveries in fruit concentration WITHOUT THE USE OF FLAVOR KILLING HEAT, the ALVA laboratories now offer True Fruit flavors containing a considerably higher percentage of the fugitive volatile essences so vital to the fresh, true flavor of natural fruits.

Normally lost in distillation, these essences are initially captured and ultimately returned to the concentrate in the unusual equipment built by ALVA technicians. The result is a concentrate that is fresher, possesses more body and will go further in natural flavoring.

This remarkable technique is now standard in the production of ALVA True Fruits.

There's a difference . . . All the flavor is there . . . We'll send you samples for comparison.

Write for your copy of the complete ALVA Flavors Catalog

VAN AMERINGEN-HAEBLER, INC.
521 WEST 57th STREET, NEW YORK 19, N. Y.

Alva FLAVORS

Facts...

about the

ROCON SYSTEM

for Control of Rats and Mice

Successful rodent control requires three basic factors: 1. an effective rodenticide, 2. an attractive bait and 3. suitable dispensing equipment. Simply stated, the Rocon System is an integrated combination of these three essential factors—a "complete package" which offers exceptionally high continuous control, affords substantial savings in control establishment and maintenance and reduces hazard to personnel and animals to an almost negligible minimum.

Warfarin

+

High-Palatability Bait

+

Efficient Bait Stations

Developed by the Wisconsin Alumni Research Foundation, the remarkable new rodenticide used in the Rocon System is radically different from anything previously available. Ingested in minute quantities over a consecutive five to ten-day period, it kills painlessly by producing internal hemorrhage. Tasteless, odorless—**creates no bait shyness!** Makes "complete" control easily attainable.

Not just a "souped up" dog meal, but a special formula **from 2 to 10 times more acceptable to rats and mice than any other bait tested!** Rocon bait, containing .025% Warfarin, is the result of more than a year of exclusive rat feeding tests under laboratory and field conditions. A cereal-type bait with excellent keeping qualities, it remains a "preferred" food even when rats are offered an unlimited free choice.

Rats and mice enter and leave freely. Larger animals can't enter at all. Unauthorized personnel are locked out. Rocon Bait Stations with Rocon Dry Bait Feeders or Liquid Dispensers (Pat. applied for) provide maximum safety with time-saving ease of servicing—**meet basic requirements for poisons and bait stations as outlined by the B.A.I.**

For complete information, write, wire or phone...

Mr. D. W. CLUFF, Sales Manager

ROCON INC. 1020 Speer Boulevard · Denver 4, Colorado

An outstanding

fresh butter flavor

in three superior types

All three variations of this remarkable imitation flavor are stable to heat and have unusually long shelf life.

Two are designed for use in confectionery and in baking, one being soluble in fatty compounds, the other soluble in water. The former has also been most effective in margarine. The third type contains no diacetyl.

The three constitute an unparalleled triangle of powerful butter flavor materials.

Firmenich Incorporated • 250 West 18th St., New York 11

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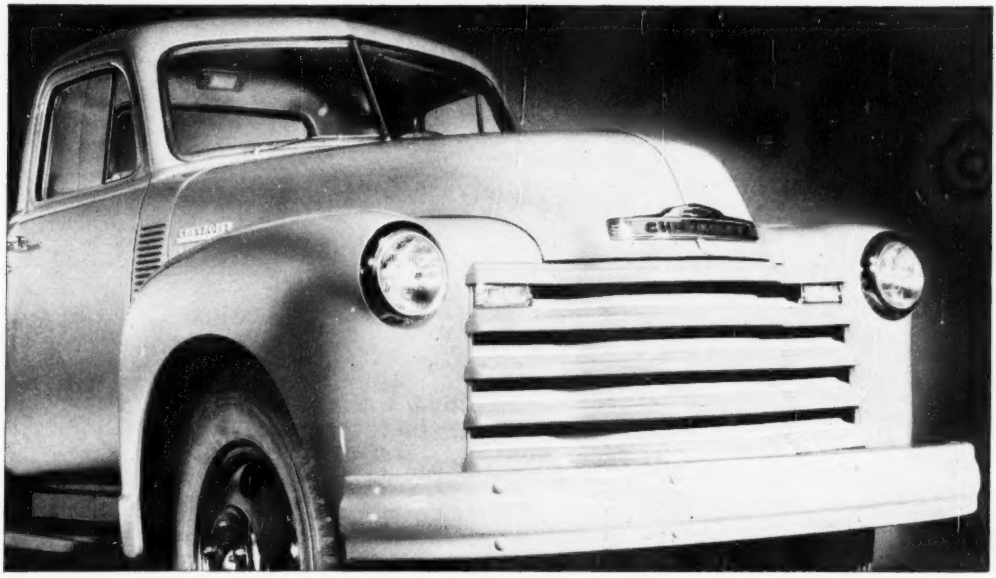
FIRMENICH & CIE.
SUCCESSEURS DE
CHUIT NAEF & CIE.
GENEVE SUISSE

NEW 1951
CHEVROLET ADVANCE-DESIGN TRUCKS



New FEATURES! New QUALITY! New VALUE!

You'll find everything in these new 1951 Chevrolet trucks—everything that has made Chevrolet the world's most popular make *plus* new features and improvements that put them still farther ahead of the field. As a truck user, you'll welcome Chevrolet's new, better designed brakes for their increased effectiveness . . . their thrifty long life and extra safety! You'll recognize important contributions to trucking in Chevrolet's Dual-Shoe parking brake, the new Ventipanes, and Chevrolet's new cab seats . . . the very tops for riding comfort! See your Chevrolet dealer and take a good look at these 1951 Chevrolet trucks at your first opportunity. The "best in the business" are better than ever today! Chevrolet Motor Division, *General Motors Corp.*, Detroit 2, Mich.

CHEVROLET ADVANCE-DESIGN TRUCK FEATURES

TWO GREAT VALVE-IN-HEAD ENGINES—the 105-h.p. Loadmaster or the 92-h.p. Thriftmaster—to give you greater power per gallon, lower cost per load • **POWER-JET CARBURETOR**—for smooth, quick acceleration response • **DIAPHRAGM SPRING CLUTCH**—for easy-action engagement • **SYNCHRO-MESH TRANSMISSIONS**—for fast, smooth shifting • **HYPOID REAR AXLES**—for dependability and long life • **NEW TORQUE-ACTION BRAKES**—for light-duty models • **PROVED DEPENDABLE DOUBLE-ARTICULATED BRAKES**—for medium-duty models • **NEW TWIN-ACTION REAR BRAKES**—for heavy-duty models • **NEW DUAL-SHOE PARKING BRAKE**—for greater holding ability on heavy-duty models • **NEW CAB SEATS**—for complete riding comfort • **NEW VENTIPANES**—for improved cab ventilation • **WIDE-BASE WHEELS**—for increased tire mileage • **BALL-TYPE STEERING**—for easier handling • **UNIT-DESIGN BODIES**—for greater load protection • **ADVANCE-DESIGN STYLING**—for increased comfort and modern appearance.

CHEVROLET

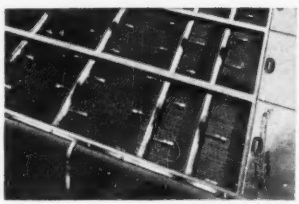
MINUTE MAID CORPORATION Uses Barry-Wehmiller VORTEX Freezer

to Speed Frozen Fruit Juice Production with Continuous, Automatic Operation

Illustrated above is a "Vortex" freezer in the Plymouth, Florida, plant of Minute Maid Corporation, one of the country's leading processors of frozen foods. The "Vortex" is entirely automatic in operation and is run continuously with no operators required. Positive control of time and temperature are assured, plus reduced operating costs.

Heat transfer is accomplished by the famous Barry-Wehmiller "Vortex" system of atomized sprays—special spray nozzles provide unvarying heat transfer with a minimum of pump horsepower.

Movement of containers through the freezing process is by the patented "Walking-Beam" conveyor with two moving grates which permit infinite speed changes for varying process requirements. As the forward movement of the "Walking-Beam" never exceeds a four-inch stroke, the conveyor remains at the same temperature as the sprayed solution—no solution is carried out of the cold zone. The "Vortex" saves space, consumes less power, for the hydraulic drive of the "Walking-Beam" dispenses with chains, reducing gears and cam movements—holds friction to a minimum.



View of "Vortex" freezer with top removed showing "Walking-Beam" conveyor grates and atomized spray nozzles.

"Vortex" freezers, coolers, exhaust boxes and pasteurizers have a wide application to many food processes. Write for full information on the "Vortex" model that will cut costs and aid production in your own plant.

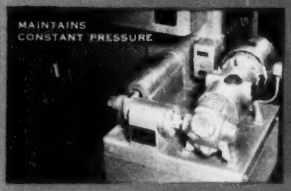
See our Exhibit at the Canning Machinery Exposition, Booth 10, Chicago, February 17 - 22, 1951.

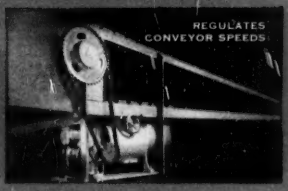
KNOWN THE WORLD OVER

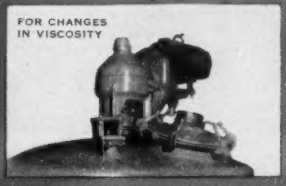
BARRY-WEHMILLER Machinery Co. BW-240R

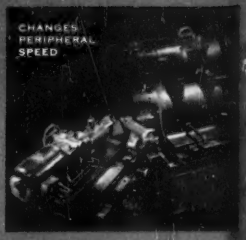
4660 W. FLORISSANT AVENUE • ST. LOUIS 15, MO., U.S.A.

NEW YORK, CHICAGO, CLEVELAND, NEW ORLEANS, SAN FRANCISCO, MEXICO CITY, MEXICO, GUAYAQUIL, ECUADOR, RIO DE JANEIRO, BRAZIL









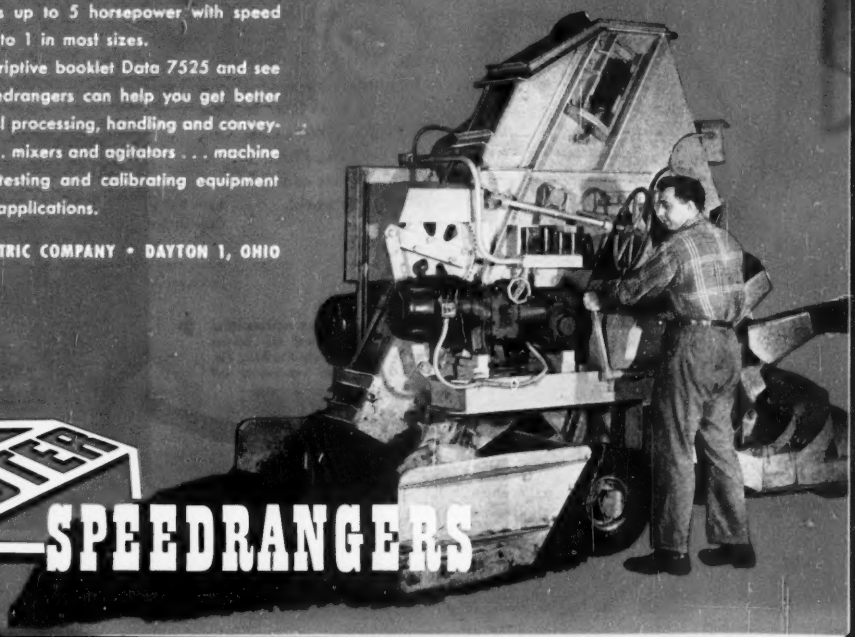
again and again
variable speed operation
makes a good job better

Better because variable speed operation pays off in higher rates of production, a more uniform better quality product and more efficient performance of your equipment and your operators.

Make the job better still by using Master Speedrangers because their all-metal construction makes them extremely compact and durable . . . more flexible and adaptable to a wide range of uses. They're available in sizes up to 5 horsepower with speed ranges up to 12 to 1 in most sizes.

Write for descriptive booklet Data 7525 and see how Master Speedrangers can help you get better results on material processing, handling and conveying equipment . . . mixers and agitators . . . machine tool drives . . . testing and calibrating equipment and many other applications.

THE MASTER ELECTRIC COMPANY • DAYTON 1, OHIO



MASTER SPEEDRANGERS

A WHOLE NEW CONCEPT OF INSTRUMENTATION IS REVOLUTIONIZING THE FOOD

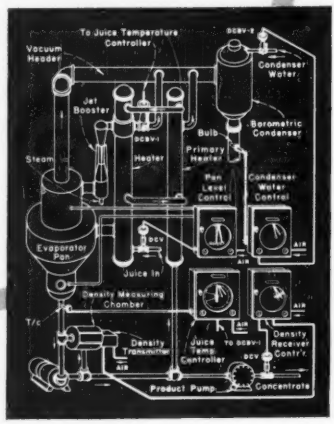
PASCO ACHIEVES UNPRECEDENTED

REVOLUTIONARY BROWN CONTROL

LIKE conventional process equipment and methods . . . conventional instrumentation is going by the boards. Changes are being made . . . daring, radical changes which bring an entirely new concept of process possibilities to the industry. One realization of this is illustrated in the operation of the world's largest frozen juice plant—the Pasco Packing Co. plant at Dade City, Fla.

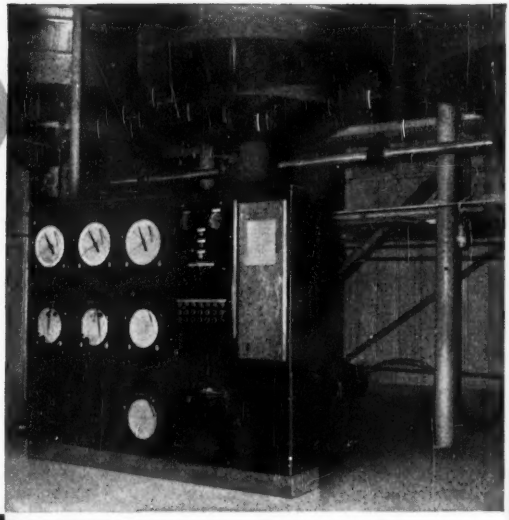
Pasco has discovered that *only through a complete control system can close control of variables and high operating efficiencies be assured.* Proof of this is found in the plant's evaporator control system. The unique evaporators, designed by C. D. Atkins of the Florida Citrus Experiment Station, required a creative application of instruments. Controls for density, level, temperature and flow were all integrated into a completely automatic system. As a result, *creative instrumentation* permits an hourly production of 1250 gallons of 42° Brix concentrate in a *1 man operation!*

In this plant, continuous measurement and automatic control maintain high production of a top quality product with a minimum of personal supervision. The same *creative instrumentation* which is helping Pasco produce better products at lower cost can also help you. Call in your local Honeywell engineer today . . . he is as near as your phone. MINNEAPOLIS-HONEYWELL REGULATOR CO., *Industrial Division*, 4502 Wayne Ave., Phila. 44, Pa. Offices in more than 80 principal cities of the United States, Canada and throughout the world.

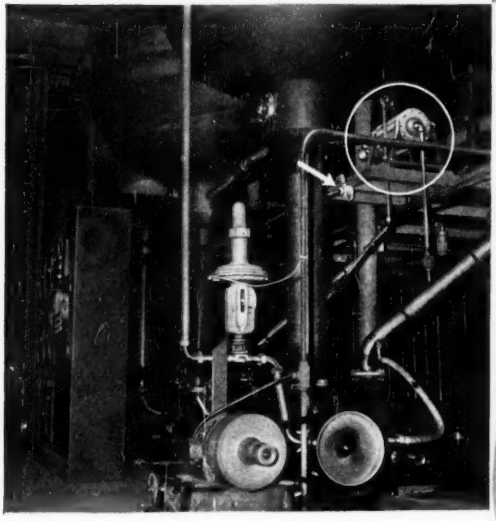


Schematic drawing representing control system used on Atkins evaporator at Pasco Packing Co. Evaporator pan represents all three stages.

EFFICIENCY WITH SYSTEM



Atkins evaporators are visible behind control panel. One man operates both triple-stage evaporators with the aid of Brown instrument control board to turn out 1250 gallons of high-quality 42° Brix juice per hour. ▶



▲

Density sampling chamber (circled) continuously measures density of juice leaving last stage of evaporator; adjusts rate of removal through Honeywell-Saunders Patent Valve in foreground. Thermocouple (arrow) measures juice temperature, is connected to ElectroniK recorder.

An example of Honeywell creative instrumentation in the Pasco installation is the new Density Controller . . . heart of the evaporator control system, it controls final product concentration. The density controller consists of:

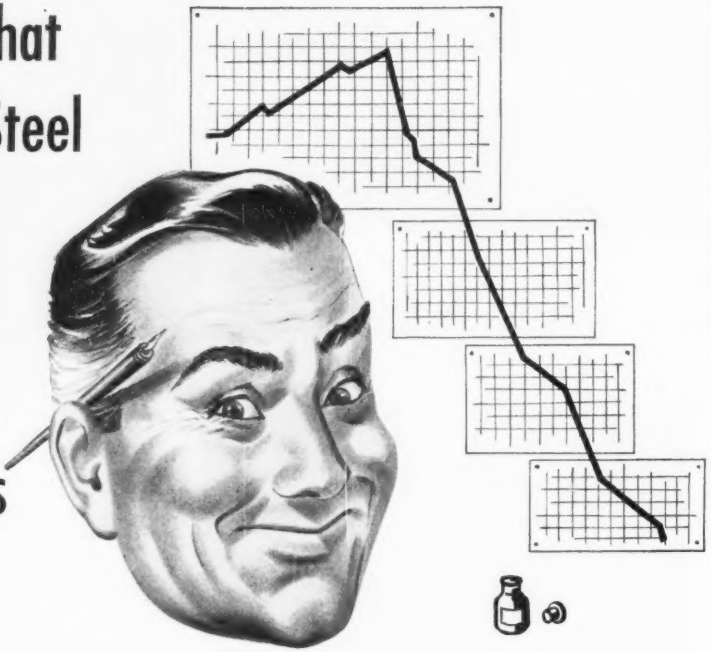
1. ***A chamber through which a sample of the concentrated juice is continuously passed.***
2. ***A submerged displacer whose buoyancy varies with the density of the fluid in which it is immersed.***
3. ***A pneumatic-balance unit.***
4. ***An instrument which measures the buoyancy of the displacer.***

The versatility of this unique sensing unit makes possible the measurement of specific gravities over a wide range.

MINNEAPOLIS **Honeywell**

BROWN INSTRUMENTS

This is what Stainless Steel does to cleaning costs



DOWN, down, down to rock bottom go cleaning costs when you're dealing with time-tested Allegheny Metal. It happens in dairies, food-plants, hospitals, restaurants, refineries, drug, textile and chemical plants . . . *everywhere!*

In fact—and here's a truth for you to keep in mind—it costs far less over the long run to clean stainless steel and keep it clean than any other commercially-available metal. What's more, you can achieve more complete sanitation, get more lasting good looks and realize longer life in service. *No other metal* is as resistant to corrosion and heat as stainless steel—and at the same time as strong and as hard-surfaced and resistant to wear.

That's a value-packed assortment of properties which have made Allegheny Metal indispensable for a great number of essential industrial and armament uses. We're continuing to spend millions of dollars to expand our already greatly increased production. • In addition, we invite any fabricator to let us help find possible ways of using Allegheny Metal *better*, in order to get more out of every ton.

* * * * *

Complete technical and fabricating data—engineering help, too—are yours for the asking from Allegheny Ludlum Steel Corporation, Pittsburgh, Pa. . . . the nation's leading producer of stainless steel in all forms. Branch Offices are located in principal cities, coast to coast, and Warehouse Stocks of Allegheny Stainless Steel are carried by all Joseph T. Ryerson & Son, Inc. plants.

You can make it **BETTER** with

Allegheny Metal

AL TIME-TESTED STAINLESS STEEL

W&D 3260

WOULD YOU PLAY A TOURNAMENT *with one club?*

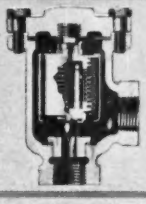
But on the golf course you can see the results. In steam hook-ups on the other hand, bad performance may go undetected for years, even though the traps apparently are working properly.

If you are in competition, it is certain that you cannot get the lowest fuel costs and highest production rates from steam heating and process equipment by "standardizing" on one type of steam trap for all purposes in your plant.

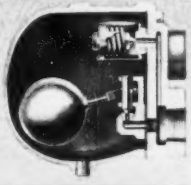
The four principal types of Sarco steam traps are illustrated at the right. They are available in a wide range of sizes and steam pressures and each has a specific function. The trick is to get the right trap on every steam job and every steam line in your plant. This can be done by calling in the Sarco Representative near you, or by asking for Sarco Catalog No. 1600 which gives recommendations for trapping all kinds of equipment, both indoors and out.

STEAM TRAPS ARE LIKE THAT...

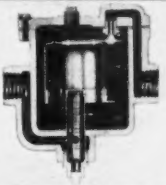
Thermostatic Trap



Float-Thermostatic Trap



Bucket Trap



Liquid Expansion Trap

312

SARCO SAVES STEAM

SARCO COMPANY, INC.

Represented in Principal Cities

Empire State Building, New York 1, N. Y.

SARCO CANADA, LTD., TORONTO 5, ONTARIO

IMPROVES PRODUCT QUALITY AND OUTPUT

for **brighter, tastier** Salmon Fillets use a PFIZER ASCORBIC ACID dip before freezing

Even the fillets and steaks of "fast-rusting" pink salmon can be protected against color and flavor loss with a Pfizer Ascorbic Acid dip. Treated this way, perishable frozen salmon, halibut, mackerel and tuna stay bright and tasty . . . command top prices.

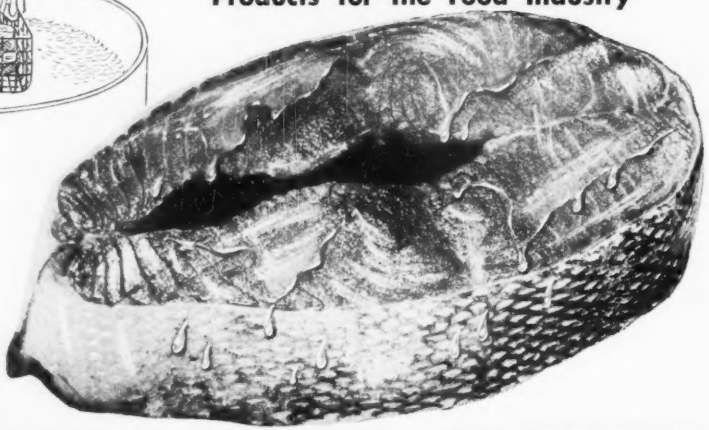
This vitamin-antioxidant is easy to incorporate in your normal processing procedure whether you use hand-dipping, brining tanks, half cylindrical tanks with paddlewheel or troughs with elevating belt. Fillets may be dipped briefly in an 0.5% to 2.0% solution. A reduced strength solution of 0.25% to 1.0% is suggested when a thickening agent is added to prolong contact. Even lower percentages of ascorbic acid are possible when citric acid is included in the dip.

For top quality, always specify Pfizer Ascorbic Acid. This pure, crystalline product is widely used throughout the food industry to preserve frozen peaches and apples, and to fortify fresh fruit juices and certain new dairy products. For further information, samples and prices, just drop us a line.

Specify **PFIZER**

PFIZER QUALITY ®

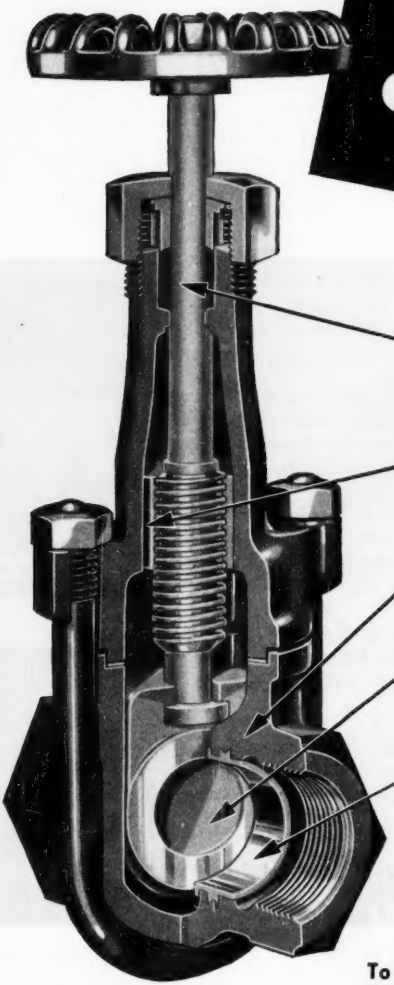
Products for the Food Industry



For the Frozen Food Industry—Ascorbic Acid, Ascorbic-Citric Mixtures • **For the Dairy Industry**—Vitamin A, Sodium Citrate and Ascorbic Acid • **For the Milling Industry**—Bi-Cap Enrichment Concentrates • **For the Baking Industry**—Enrichment Wafers, Gluconic and Fumaric Acids • **For the Feed Industry**—Bi-Con Terramycin and Vitamin B12 Supplements, Riboflavin and Iodides.

CHAS. PFIZER & CO., INC., 630 FLUSHING AVE., BROOKLYN 6, N. Y.; 425 NORTH MICHIGAN AVE., CHICAGO 11, ILL.; 605 THIRD ST., SAN FRANCISCO 7, CALIF.

ONLY THESE CLIP GATES GIVE YOU THIS COMBINATION



★ **STEM LIFE INCREASED 20 TO 30 TIMES** Valve stems of the new OIC Alloy 40 offer greatest resistance to corrosion, wear and galling; no seizing.

★ This special, extra large duct permits complete drainage of the bonnet and prevents damage by freezing.

★ Thick, scientifically designed walls make OIC Valves strong and sturdy. No distortion.

★ Wide wedge prevents warping and allows plenty of space for accurate seating. OIC Clip Gates pass rigid air tests; no oil or wax on seating surfaces to hide leakers.

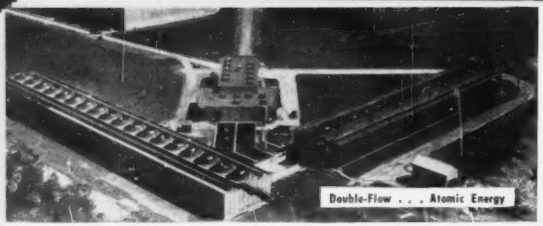
★ *Exclusive in OIC Clip Gates, 2" and under:* Seats are cast in place and then rolled to make *doubly sure* they are tight and secure. Greatly superior to simply rolling in against machined surfaces.

To be certain of the best, ask for OIC Clip Gates.
The Ohio Injector Company, Wadsworth, Ohio.

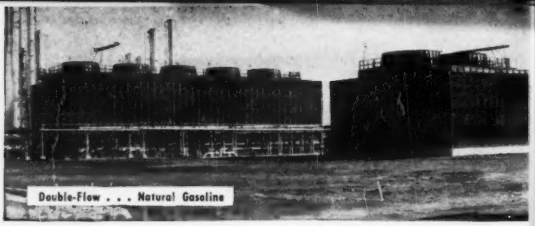
OIC
FOUNDED 1883

VALVES

FORGED AND CAST STEEL · IRON · BRONZE

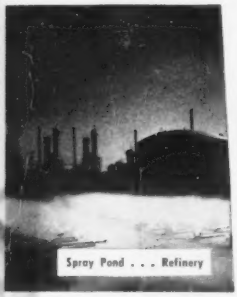


Double-Flow . . . Atomic Energy



Double-Flow . . . Natural Gasoline

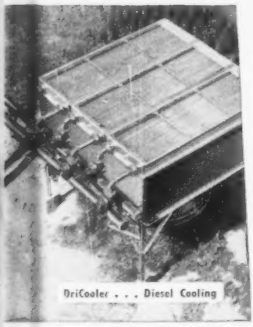
WHAT IS YOUR COOLING PROBLEM?



Spray Pond . . . Refinery

IS IT COST? Cooling towers or DriCoolers can have a low first cost with higher operating cost and vice versa. Or, you can get an economical combination of both. Marley application engineers have a complete line of units to select from and the "know-how" to help you make the best selection for your purpose.

Conventional . . . Pipe Line

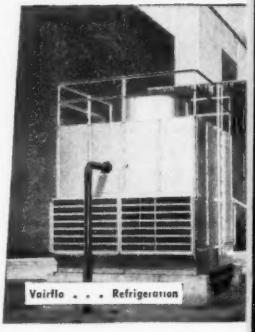


DriCooler . . . Diesel Cooling

IS IT SPACE? Marley equipment may be installed indoors or outdoors. Units are available with large base area and low height to give light loading per square foot or with small base area and greater height to fit in small area.

IS IT TEMPERATURE? Usually, it is not economical to cool lower than a 5F approach to the wet bulb. However, in Marley cross-flow towers a quantity of water at wet bulb temperature may be obtained without added cost. For high level cooling, the DriCooler is applicable.

IS IT LOCATION? Extreme temperatures, cold or hot, dust, wet bulb, altitude, brackish water, wind, storm conditions, or lack of proper water supply are problems that must be considered. Marley has a unit to fit any geographical condition.



Vairflo . . . Refrigeration

IS IT APPEARANCE? Marley has a wide range of designs that will blend with any building architecture. Or even become a part of the building itself. Marley engineers can help your architect give you a good looking as well as efficient installation.

These are only a few of the problems you may face in the selection of a cooling tower or DriCooler. No matter what the problem, Marley Application Engineers have the answer to help you invest your dollars wisely and profitably.

Double-Flow . . . Power

MARLEY

DriCooler . . . Gas Cooling

Natural Draft . . . Air Conditioning

FI-1

Write, Wire or Phone The Marley Company, Inc., Kansas City 15, Kansas.

Name _____ Title _____

Company _____

Address _____

City _____ Zone _____ State _____

☐ Please send "What's Your Cooling Tower IQ"

☐ Our Cooling Problem is _____

Aquatower . . . Air Conditioning

USING

Liquid Sugar IMPROVES CAKE QUALITY!

AS REPORTED in Food Industries, August, 1950, studies by Baking Laboratories show that using sugar in liquid form gives cakes greater quality. The layers have a maximum volume, improved emulsion and an unusual degree of aeration. In addition, less leavening is required.

Flo-Sweet's own research shows, further, that baked goods made with the right liquid sugar stay fresh and salable longer, reducing costly returns.

The use of liquid sugar is a valuable progressive step in cake-making technology.

Why FLO-SWEET® is the quality liquid sugar to use

Flo-Sweet has pioneered and specialized in one field only—liquid sugar. Its production facilities are unsurpassed.

☆ Centrifugal Purification: The latest, high-speed centrifugals completely separate impurities from the crystals in raw sugar.

☆ Improved Defecation: All sugar liquor passing through our refinery is defecated by an improved method for increased purity.

☆ Char Purifications: By both bone-char and vegetable-char treatment. This brings Flo-Sweet Liquid Sugar to the peak of quality.

☆ Control Laboratories: Various plant control laboratories constantly check on the quality and purity of Flo-Sweet.

When you get FLO-SWEET, you get quality backed by 27 years of successful liquid sugar development and production. Therefore, you get more product improvement, more product control and always-dependable sanitation and service.

flo-sweet

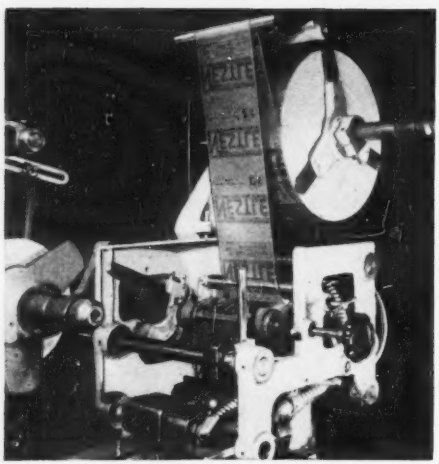
Manufactured only by

REFINED SYRUPS & SUGARS, INC.

Yonkers 1, New York

PIONEERS IN LIQUID SUGAR FOR SAVINGS, SANITATION AND SERVICE

faster packaging, hairline register, and less waste!



SAVES WRAPPING MATERIAL!

At the Peter Cailler Kohler Swiss Chocolate Co. plant in Fulton, N. Y., Nestle chocolate bars are quickly wrapped in this packaging machine. Here, G-E cut-off register control has meant a big saving in wrapping material, plus an increased production rate, over the mechanical method previously used, which often wasted material through poor register and periodic jams.

G-E register controls—cut-off, side, and color—boost packaging speed, maintain pin-point accuracy, cut waste due to rejects!

In these days of self-service retailing, your product's "buy-appeal" is far greater when you package it in a neat, attractive wrapper—precision printed and cut with General Electric register controls. Automatic in operation, these electronic aids for food packaging also give you these advantages:

Increased production through automatic operation and higher machine speeds. *Lower material and labor costs* which often justify the equipment's entire cost. *Low maintenance* due to few moving parts, with automatically-maintained register eliminating need for constant visual inspection. *Easy operation* that requires no special training, enables operators to devote more time to other duties. *Maximum flexibility,* permitting controls to work equally well on paper, cellophane, metal foil, or cloth.

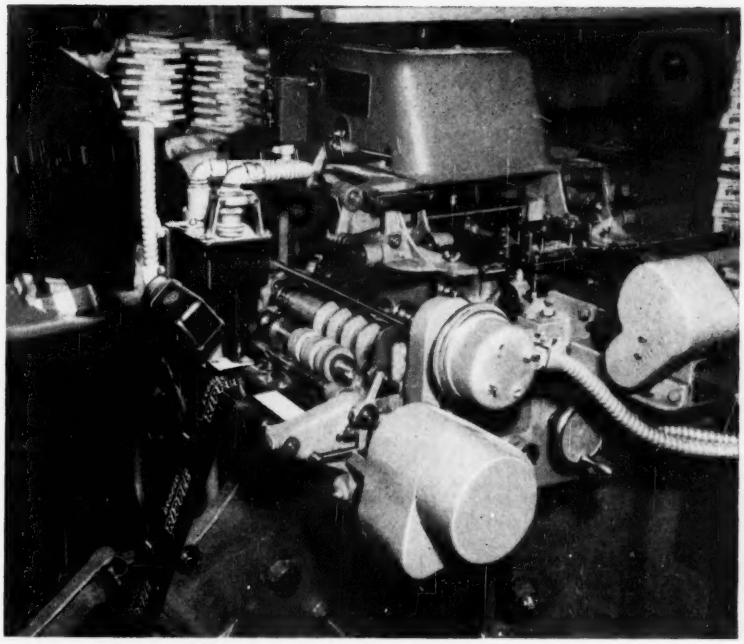
Use *cut-off register control* for your wrapping operations, *side-register control* for your slitters or wherever the web must be guided, and, if you do your own printing, *color-register control* for your web-fed gravure or offset presses. Ask your G-E food industry specialist how to apply these G-E register controls to boost output, cut costs in packaging *your* food products. *Apparatus Department, General Electric Company, Schenectady 5, N. Y.*

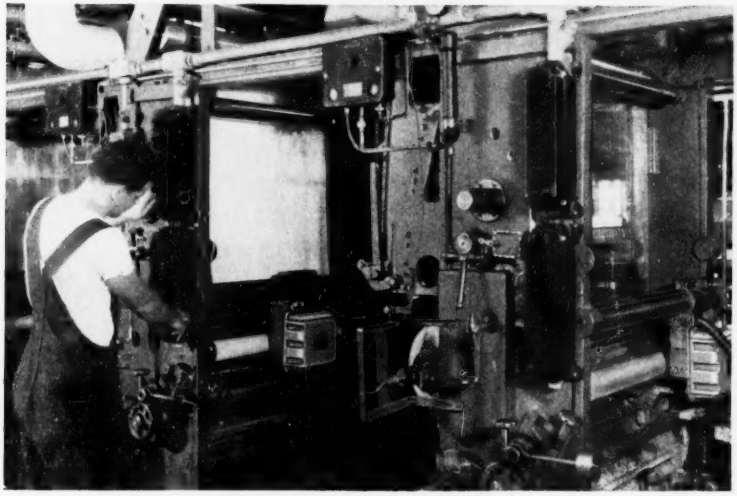
GENERAL ELECTRIC

652-7

SAVES MANHOURS!

Where eight people were once needed at the Golden Nugget Sweets, Ltd., plant in San Francisco to hand wrap and box candy bars, only two have been needed since the installation of a wrapping machine with G-E cut-off register control. Since register is maintained automatically, the control eliminates the need for constant visual inspection. Moreover, it permits wrapping as many as 115 candy bars per minute while cutting the preprinted paper roll to exact lengths and precisely positioning the printed design. Electronically controlled, this G-E device has few wearing parts, requires but little maintenance.





SAVES PRODUCTION TIME!

At Milprint, Inc., in Milwaukee, which prints multi-color wrappers on a continuous roll for use by food packers, G-E color-register control has permitted a substantial increase in press speeds. Close register is held on this rotary gravure press even on such difficult materials as cellophane, pliofilm, and cellulose acetate. As a result, this company calculates the saving in rejects will more than pay for the G-E equipment within a year.

GE

REGISTER CONTROLS for food packers

NEW! Betner "Duo-Tite" Bag

TOP & BOTTOM
Inner heat-seal plus added strength and protection of the "Duo-Tite" turnover.

If there is any bag that *positively won't* permit dry particles to sift, this is it! Betner's new method of construction combines special liners with folding, gluing and heat-sealing in such a way that there is virtually "No Sift" for contents.

This new Betner bag is perfect for insecticides, fertilizers and other chemicals that must be packaged in sift proof containers. It is also ideally suited for packaging foods. Available in sizes holding from 5 to 25 lbs. of bulk powdered material; can be preprinted up to four colors; and can be made in several combinations of materials.

and...

Betner can supply the special machinery for closing the "Duo-Tite" bag . . . it heat-seals, double folds and pastes the tops in exactly the same manner as the bottom is constructed. Your inquiries are welcome, and samples with full technical information will be supplied promptly.

Benj C Betner Co DEVON, PA.

BENJ. C. BETNER of Va., Richmond, Va.; BENJ. C. BETNER CO. of WISCONSIN, Appleton, Wisconsin; BENJ. C. BETNER CO., Paris, Texas; BENJ. C. BETNER CO. of CALIFORNIA, Los Angeles, California

A complete bag service—from idea to finished bag to machinery for closing coffee bags and filling and closing liner bags for cartons.

FOR EVEN TEMPERATURES

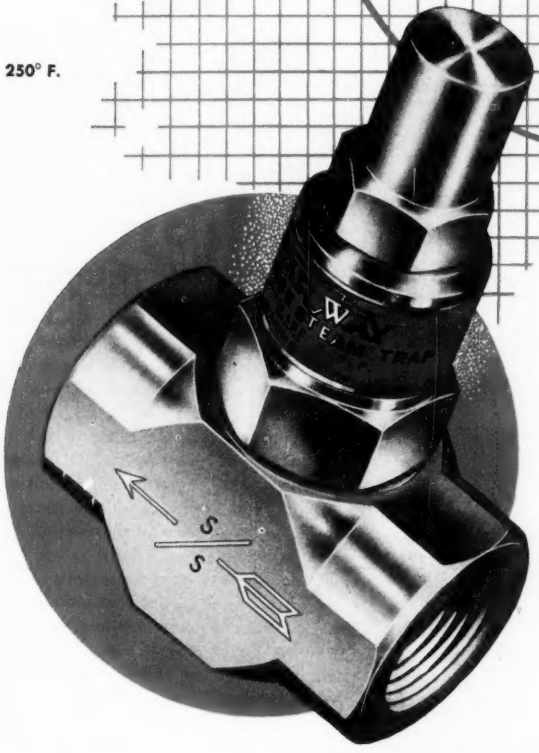
400° F.

350° F.

300° F.

250° F.

YARWAY STEAM TRAPS



● Processes requiring careful temperature control call for Yarway Impulse Steam Traps on steam equipment.

The reason! . . Yarway traps maintain even temperatures because they *continually* sample and respond to a trickle of the condensate. There is no arrest in flow, no waiting for large quantities of condensate to accumulate, or trapped steam pockets to condense.

Other reasons why Yarway Impulse Traps have become first choice in many thousands of plants:

- **They get equipment hotter, sooner**
- **Small size, light weight**
- **Easy to install, easy to maintain**
- **Only one moving part**
- **Good for all pressures**
- **Stainless steel construction**
- **Low cost**

If you are not already familiar with these and other advantages of the Yarway Impusle Steam Trap, try one *for free* and find out for yourself. Call your nearby Yarway distributor, or write to:

YARNALL-WARING COMPANY

127 Mermaid Avenue • Philadelphia 18, Pa.

BRANCH OFFICES IN PRINCIPAL CITIES

Stainless Steel Body

YARWAY IMPULSE STEAM TRAP

At television time, just watch
Things rich with NORDA BUTTERSCOTCH
Make Jimmy, Tom, and little Mabel
Finish dinner at the table

Norda Butterscotch tastes very good. And it should.

There's honest butter-goodness in Norda Butterscotch Flavor. Genuine and hearty imitation are blended in expert ways learned from long-past days, by skilled Norda flavor craftsmen.

Make better butterscotch mixes, syrups, gelatins, and candies by depending on NORDA quality-born Butterscotch Flavor. Use it for more popular products.

Test it thoroughly first. Send for samples of Norda Butterscotch and other fine flavors today.

Norda Butterscotch . . . Another "Favorite to Flavor It"

Norda ESSENTIAL OIL AND CHEMICAL COMPANY, INC.
601 West 26th Street, New York 1, N. Y.

CHICAGO • LOS ANGELES • ST. PAUL • MONTREAL • TORONTO • HAVANA • MEXICO CITY • LONDON • PARIS

Economical GAS Supplies delicious SPUDNUTS Fresh Each Day

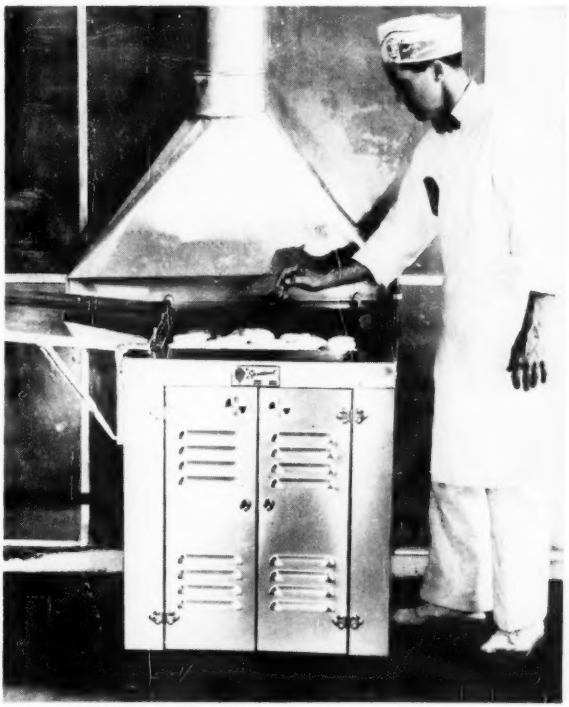
Home of Pelton's Spudnuts, Inc., Salt Lake City. Pilot plant and test shop is in right side of building.

"Less maintenance cost, lower operating costs," say Al and Bob Pelton about the advantages of modern Gas Equipment for baking. The Peltons, Co-Presidents of Pelton's Spudnuts, Inc., Salt Lake City, started with a new bakery idea 10 years ago, and turned it into a top-selling specialty.

Spudnuts have a potato base, and an exciting flavor all their own. Since 1940 the company has grown from 1 to nearly 300 shops in the U. S., with shops also operating in Alaska. The Peltons use Gas, not only to bake the light, fluffy Spudnuts perfectly, but to fire the Gas water heater, the Gas overhead heaters and the Gas furnace. Their model Test Shop with the Gas-fired Spudnut fryer is a research plant for study and improvement of Spudnuts.

GAS provides an economical, dependable way of baking for Al and Bob, and keeps maintenance costs low. Gas can do your baking better, too, because you get the exact temperatures you want, when you want them, with Gas. The cleanliness and thriftiness of Gas will appeal to you. Find out about Modern Gas Equipment from your Gas Company Representative—call him today!

Modern Gas fryer manufactured by Anetsberger Brothers, Inc., Northbrook, Ill.



Mr. Max Baker, Spudnut Corporation's Test Shop Manager, turns Spudnuts in their new Gas fryer.

AMERICAN GAS ASSOCIATION

420 LEXINGTON AVENUE, NEW YORK 17, NEW YORK

No clerk has to tell her *now-a-days!*

Only yesterday, the grocer *told her.* Now *she* tells *him!* Now she shops alone—and loves it!

Hence these questions:

Which food packaging method best fits the habits of the shopper in the modern, clerk-less store? Which will most readily capture her fancy—and her trade?

There's nothing more modern than a good self-service food store.

Yet, even these models of modernity still harbor many a reminder of the horse-and-buggy days . . . the days when the grocer's clerk was a factor in almost every sale.

Take food packaging, for example:

Anyone who considers the full implications of the self-service revolution must recognize that the function of a food package isn't as simple as it used to

To help self-service selling • there's nothing

be. To make a package *sell itself* you need something more than just a good container. A self-selling package will inevitably need certain elements which grow directly out of the self-service situation.

That's why there has been such a great revolution in food packaging right along with the revolution in food retailing. That's why *visible* packaging especially has moved ahead so fast. And that's also why many food packages still need to be reviewed in the light of present-day facts.

Consider, then, one of the great forces for making a food package live up to the full possibilities of self-service selling—*the great team of Glass + Vapor-Vacuum.*

When you look at the packaging revolution, you can't help but remember that much of its success must be credited to this one great factor.

When a food has to sell itself, without benefit of demonstration or helpful clerks, *Glass + Vapor-Vacuum* provides all the necessary elements.

Being visual, it attracts, explains and stimulates desire.

But even more important, perhaps, is *the ever-present fact that Glass + Vapor-Vacuum builds and conveys faith.* All through the years of the great advance in self-service, Glass + Vapor-Vacuum has been convincing the consumer that

packaged food is *safe* . . . that every package can be depended on to deliver food with all its original goodness.

Tens of billions of times, Vapor-Vacuum sealed packages have delivered their contents in this faith-building manner. Tens of billions of times, they have helped the cause of modern food merchandising by proving that there is no finer, safer food in all the world than the packaged foods on the self-service store shelves.

For an excellent example of the relation between self-service and Vapor-Vacuum, consider PICKLES. An ideal *impulse purchase item,* pickles do their best when Vapor-Vacuum Sealed. That's why such a huge and growing portion of the pickle pack is now packaged this way.

better than GLASS + VAPOR - VACUUM

Use Stainless Tubing and Pipe?

Call Ryerson for Quick Shipment

The country's largest stocks of stainless tubing and pipe await your call at Ryerson. On hand for immediate delivery are nineteen distinct kinds—both seamless and welded—in a wide range of sizes. Our stocks also include stainless pipe fittings and fastenings for every requirement.

The stainless tubing and pipe you get from Ryerson is of highest quality and meets the exacting requirements of ASTM Specs. You can count on its size accuracy and scale-free finish. You can form and weld it readily, thread it accurately. And when you call Ryerson, America's pioneer warehouse distributor of stainless, you put 25 years of practical stainless experience to work for you.

Ryerson protects the high quality of all stainless tubing and pipe stocks by expert handling. Our facilities include modern equipment to cut your stainless exactly to order and deliver it promptly. So, for complete stainless service, call your nearby Ryerson Plant.

STAINLESS TUBING AND PIPE IN STOCK

TP304 TUBING	Seamless & Welded
TP316 TUBING	Welded
TP304 PIPE	Schedule 5—Light Wall—Welded
	Schedule 10—Light Wall—Seamless & Welded
	Schedule 40—Standard Weight—Seamless & Welded
	Schedule 80—Extra Heavy Weight—Seamless
TP316 PIPE	Schedule 5—Light Wall—Welded
	Schedule 10—Light Wall—Welded
	Schedule 40—Standard Weight—Seamless & Welded
TP 347 PIPE and/or 304 ELC	Schedule 5—Light Wall—Welded
	Schedule 10—Light Wall—Seamless & Welded
	Schedule 40—Standard Weight—Seamless & Welded
	Schedule 80—Extra Heavy Weight—Seamless

STAINLESS FITTINGS & FASTENINGS—Screwed and welding pipe fittings, welding spuds, valves, bolts, screws, washers, etc.

Also Stainless, Alloy & Carbon Steels—Bars, Structurals, Plates, Sheets, etc.

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • PHILADELPHIA • DETROIT • CINCINNATI
CLEVELAND • PITTSBURGH • BUFFALO • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO

RYERSON STEEL

JANUARY, 1951

Food Industries

Prepare to Meet Serious Manpower Shortage

Few realize the seriousness of the manpower problem to be faced soon in this country. The available working force was almost completely utilized even before the defense program got started. And the program is not sufficiently underway yet for its impact to be felt strongly.

As early as October, unemployment had dropped to 1.9 million compared to 4.7 million in February. And the areas with a tight or balanced labor supply—less than 3 percent unemployment—increased from 19 to 51 between July and September. By the year's end, there were only two major areas with labor surpluses—Wilkes Barre and Scranton, Pa.

Exactly when the manpower pinch in the country will become critical is a point of difference among experts. But there seems to be general agreement among economists that the pinch resulting from the combined program of military and civil production will come sometime in 1951, probably by mid-year. Cutbacks in civilian durable goods may release employees from those industries faster than the defense program will absorb them at the beginning of the year, but that will be a temporary situation.

Here are some estimates of manpower supply and demand collected by McGraw-Hill economists: By mid-year the defense industry will need 2.5 million more workers and the military will take 1.3 million additional men. This totals 3.8 million, and is extremely conservative in view of the fact that a national emergency has since been declared.

Here are sources of additional labor: Women and older workers attracted by new opportunities, 1.1 million. Normal addition to labor force, 0.8 million. From the unemployed group, 0.8 million.

The new supply adds up to only 2.7 million, leaving a shortage of 1.1 million which must be drawn from nonessential industries.

Food processing is essential, most of it anyway. But the industry in general cannot afford the kind of wages paid by many defense factories. This means that some workers will leave food plants for higher pay elsewhere. It also means that new workers of high caliber will be hard to hire. On top of all this, will be the loss of young workers to the armed forces.

Even without war, business would face a relative shortage of manpower for some years to come. In the next ten years, the working age group (18 to 59) is expected to increase only 6 percent. In the same period, the number of school children will rise about a third, and the number of persons over 60 will increase almost as much. So the nation will have considerably greater needs, but very few more people to turn out the goods.

All this clearly points to the necessity of determining manpower requirements now and organizing procurement and training programs to meet them. And you can make a good start by dusting off your World War II experience and reviewing the methods used during that emergency to find, train and keep workers. You may want to use federal, state and private employment agencies, give present employees an incentive to bring in friends and relatives, contact local schools and clubs, write to former worthwhile employees, recall some retired workers, make provision to use handicapped and aged workers, check your job application files, and employ newspaper, radio, television and car-card advertising.

While you may not feel the need to do these things yet, you will be wise to get organized for such procurement activities before the real labor pinch hits. And don't fail to do everything within reason to keep your present workers with you.

After you procure new workers, you still have the problem of training them. Job instruction training is recommended, on a "multiplier" basis. Every member of the supervisory staff should be able to train workers, then those who are trained can train others to greatly multiply the effect of the program. And it goes without saying that subordinates should be prepared to fill the jobs above them.

Even without a national emergency, special attention to labor problems is good business management. So you have nothing to lose by being prepared—and a lot to gain.

—F. K. LAWLER, *Editor*

P.S.—The following article should help you.

America's Emergency Defense Program . . .

AUREN URIS
Editor, Research Institute of America

"How Will Mobilization

"Severely" Is the Likely Answer. So Look to Your

Military preparedness presents the food industry with its own preparedness problems. And the problems are going to be tough.

President Truman's declaration of a state of national emergency took place against a background of a Washington close to panic, a business world taut with anxiety.

The businessman's worry could be largely ended if he could get the answer to one question: What's ahead? To many, the blackest picture would be easier to accept than the dark confusions of ignorance.

The easy answer is not within Washington's power to give. Not President Harry Truman, but Premier Josef Stalin, will be calling most of the plays.

Despite the appearance of wide chaos, however, the situation is far from being unpredictable. Analysis of pertinent underlying factors helps shape some of the important answers.

Washington Viewpoint

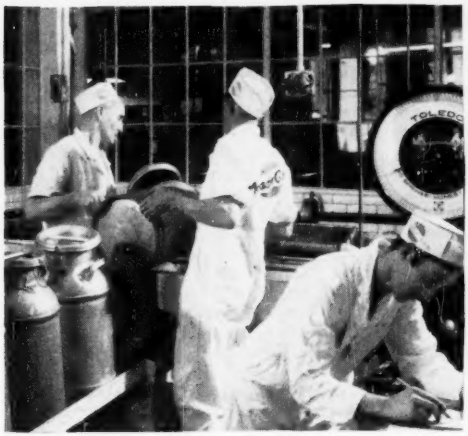
There is one Washington viewpoint you *can* bank on: Civilian needs will come second. The civilian will get what's left after defense requirements are met. The difficulties you face divide into these three related problems:

- **WHAT are the specific sorespots going to be?**
- **WHEN will they affect my organization?**
- **HOW intense will the pressure become?**

No one—in Washington or out—can answer the second and third questions now—or for quite some time to come.

The answer to the first question—"What will be the sorespots in the food industry picture?"—provides the key

. . . Poses Manpower Problems in Every Plant



Affect *My* Company?"

Workforce, Operating Conditions, and Leadership

you need for planning. You'll feel the rub in the following important areas:

Your workforce. Armed forces requirements will whittle down rosters. And the greater availability of jobs (in advance of a job freeze) and lure of higher wages (barring a wage freeze) will tempt some of your people.

Operating conditions. You'll be operating in a higher-pressure economy than from 1945 to '50 (pre-Korea). Your suppliers will give you less service and you'll have to keep going in the face of more red tape and delays. Of course, many materials useful for military purposes will disappear from the general market. Whether it's processing machinery or packaging materials, your purchasing agents will find the going as tough as in World War II.

Leadership. Your company will find its social role undergoing a change. Your relations with your people will involve more responsibility. They'll look to you for information and guidance springing from the "A-bomb" psychology affecting the country as a whole.

Let us consider some of the specifics —both problems and solutions—in each of these critical areas:

Your Workforce

For most companies, the personnel problem will provide the biggest headaches. Basically, the disruptions will result from newly sprouted defense industries and armed forces needs.

You'll have to get set for a situation tighter than in 1940. Look at the comparison:

1940—8,000,000 unemployed and available.

Now—3,000,000 unemployed and available.

1940—Normal birth-rate of the

1920's brought a sizable crop of youngsters to industry in this period.

Now—Low birth-rate of the 1930's means fewer youngsters will be available.

1940—Preceding depression made older people and housewives eager to increase income by taking on jobs.

Now—Recent period of prosperity means more "selling" to recruit those who don't actually need the money.

Big X factor is actual number of inductees. Estimates ranging from 3,000,000 to 9,000,000 have been flung around. Reason it's anybody's guess is that unfolding military events will dictate the size and rate of mobilization.

Best informed guess is that early spring will see the onset of the manpower squeeze. But don't expect controls to enter the picture immediately.

The government will count on voluntary agreements between employers to keep things on an even keel, offset "labor pirating."

Industries that need more workers will have an available supply from others that are forced to curtail output because of material shortages.

U.S. employment offices will step up their activities—even contacting workers and urging them to change jobs.

Evaluate Your Situation

The pros and cons add up to one fact: *You can't be sure of getting skilled replacements.* Consider these steps to keep your organization fully staffed:

Spot weakpoints in your present workforce. Have your Personnel Department, or supervisors of individual departments, divide the workforce into three groups:

Group A—those who will be leaving within the next year. The draft, retirement, marriage, will be some of the reasons.

Group B—those who *may* leave. This group will, for example, include those whose eligibility for the draft is in doubt.

Group C—those who, because of advanced age, seniority, or loyalty to the company, can reasonably be expected to remain.

Percentage Evaluation of Results

One company combined this group breakdown and a chart to highlight its manpower picture. Like this—

Evaluation Chart

Department Name: **Shipping**
Total No. of Employees: **24**

Group	No. Employees	Percent
A	6	25%
B	6	25%
C	12	50%

Notice that the procedure was on a *departmental* basis. This makes sense in any organization employing more than 50 people. The key to your own situation lies in the percentage of the total workforce each group represents. Consider the percentage results for each of the three groups in the light of the following possibilities:

Group A—If this group (people you expect to lose) comes to less than 10 percent of your work force, you're in pretty good shape.

But, if, through normal turnover, plus the additional current factors, you'll be losing over 25 percent of your people in the next year, prepare for trouble. Go over the following recommendations for your plan of action:

Group B—If you find 25 percent of your people "doubtful," the important thing is to re-assess this group from time to time. As new regulations go through, many cases will change to either Group A or C.

Group C—This group is your shock absorber. If less than 60 percent of your people fit in here, the steps suggested in the following brief are necessary to help you maintain some kind of balance.

Steps You Can Take

Your basic objective is to adjust to the departure of Group A individuals. You will find yourself depending more and more on those in Group C. Once you've spotted the weakpoints in your manpower setup, consider these remedial steps:

Hire for lower skills. It's easier to get people for the jobs that require little experience or training. Therefore, consider filling the jobs that demand experience and training from among Group C people who now hold jobs of lower skill.

In contemplating a move of this kind, however, consider only the individuals flexible enough to take on a new set of duties. Also, select people who can make the personal adjustments—older men, for instance, who would be willing to take orders from younger men if necessary.

Changes in qualifications for low-skill jobs should be taken into account. Many low-skill jobs, such as porter, sweeper, elevator operator, usually man-held, can be performed by women. World War II experience proves the switch can be made when prepared for properly.

Look in new places for new employees. Most of us will have to revise our notions as to *who* is capable of *what*. Sources that are usually overlooked can be your future manpower goldmines:

1. Older people. Present ideas of working age limits will vanish. Hiring people who are over 60 won't be unusual. Ability to do the job will be the sole criterion.

2. Women. Don't underestimate the power of the so-called weaker sex. They've driven taxis, trucks—and run department stores.

3. Physically handicapped. Their record in industry is excellent. Sitting-down jobs are completely within the capacity of the leg-injured. Machines with foot-pedal operation or foot control can be run by the hand-injured. When they are well placed, the handicapped generally prove to be superior workers.

4. Ex-employees. For patriotic or personal reasons, ex-employees might consider taking on their old jobs again. Look up your records, check back on temporary employees, women who left to marry, and those who left for reasons that might still permit them to return to work.

Exchange personnel information with non-competitive neighbor firms. They necessarily face the same recruiting, hiring and placement situations you do. Pooling experience can often cure mutual headaches.

Re-assess training needs. In most cases, your pre-Korea training plans will be knocked higher than a kite. People being groomed to take over certain jobs will be leaving. Some oldtimers may have to be given intensive training for completely new assignments.

In most cases, speed will be the key word in training efforts. One plant manager summed up his World War II training experience this way: "Turnover was our biggest manpower problem. We found we could get men for most of our jobs, but frequently it proved to be just a stopover on their way into the army. Six months was a frequent span of employment for us. *We had to train quickly, to get acceptable results from such short-termers.*"

Operating Conditions

It's impossible to say when the supply blackout will start for your company. But minimum planning now can help you weather a crisis that might otherwise stop you cold.

Three major steps can lighten the burden considerably:

1. Review your World War II experience.

Many of the problems about to be faced were met successfully between 1941 and 1945. But some situations were never handled satisfactorily. Remember, avoiding the mistakes can put you as far ahead as repeating the successes.

In making your review, include points such as these:

How was your company affected by World War II? Were operations enlarged or changed to any extent?

What problems did these changes cause? For example, wider activity may have resulted in a need for more

work space. Could you now accommodate a 10 percent increase in operations without increasing space requirements? 20 percent? 50 percent?

Where did such changes leave you equipment-wise? How was the problem handled? And how effectively?

What was your experience with substitute packaging materials? Would the same improvisations work now? If *unsuccessful*, do past failures suggest solutions now?

In the same way, reconsider your World War II experience in such areas as labeling, pricing, transportation.

2. Get the most out of what you've got.

Anti-waste campaigns take on new importance. Reconsider your procedures along these lines:

Can more complete instructions—or training—prevent errors that build up the garbage heap? Can greater emphasis on quality and the need to meet specifications cut down below-standard batches? Would it be advisable to set up a more accurate check so you can spot causes of poor quality and eliminate them? Are salvaging efforts, previously impractical, now worth reexamining?

Since new machines and replacement parts may become difficult, if not impossible to obtain, ask yourself the following questions:

Do your present machines require immediate replacement, overhauling or reconditioning, or stocking of key parts?

If your company has a poor safety record or high equipment-damage rate, would it be advisable to look for more or better technical assistance—a full or part-time safety engineer?

Could consultation with an engineering service or the manufacturer of the equipment give you tips on how to prolong the life of equipment by better adjustment, such as motor speeds? . . . Better maintain them, by more effective oiling and lubrication, for example? . . . Add auxiliary parts or fittings to lessen strain, or wear and tear?

Lack of essential services, such as repair and maintenance, represent a serious threat. Considering the needs of your specific operations:

Are there any services you haven't got which might keep you out of trouble? (There might be involved nothing more than getting up-to-the-minute market information on critical materials you use.)

If you anticipate hiring unskilled people for jobs where the operators ordinarily service their own equipment, might it be advisable to have the servicing concentrated in a single experienced person or agency?

3. Think your way out of trouble.

Ingenuity? It's a prime American asset. The cleverness that helped Columbus stand an egg on end seems to have permeated the continent from his three ships.

But consider: "Ideas spring from effort rather than chance." Those are the words of one of our outstanding industrial psychologists.

Here are the specific directions your efforts can take:

Avoid the "closed corporation" approach to solving problems. Your supervisors, particularly those directly involved in problem areas, can make a major contribution.

In problems centering around material shortages, using substitutes is a usual "out." Knowing what substitutes are available provides a peg on which to hang your thinking. Follow trade trends.

Run your tests *in advance*. Don't wait until the squeeze starts. If one type of machine may have to be substituted for standard equipment, make your trials ahead of time. Then you'll know what to expect.

Keep in close touch with your supervisors. Build their responsibility, their participation in operating problems. *Being warned of danger spots in advance may be the smartest step you can take to steer clear of them.*

Leadership

Your workgroup will be working under increased tensions:

The draft. Induction into the armed forces will be the fate of many Americans, male and female, young—and not so young. Few people will fail to have a friend or relative in uniform to worry about.

Overtime. Increased working time is a major reserve of our economy. When the heat's on, we'll have to dig into that reserve—and dig deep. Irritability, frictions, and fatigue increase with an expanding workweek.

Housing. There'll be unsatisfactory quarters for many—doubling up, overcrowding, and so on.

Transportation. In many of our cities, public transportation has failed to keep up with population increases. That means rush hour jamming and discomfort.

Manpower: **"Most of us will have to revise our notions as to *who* is capable of *what*. Sources that are usually overlooked can be your future manpower goldmines."**

Materials: **"Your purchasing agents will find the going as tough as in World War II."**

Operations: **"Review your World War II experience. Avoiding '41-'45 mistakes can put you as far ahead as repeating successes."**

Eating facilities. The disruptions of a defense economy mean an increasing load on restaurants, away-from-home eating places.

These and other off-the-job problems will place increasing emotional burdens on your employees. It will show up in their work—and add to yours.

Keeping Morale High

Quality will tend to lag. People will use mobilization as an excuse for poor performance. That was used—and overused—as a cover-up in World War II. You'll have to get your people to stick to standards of performance even when it becomes harder to do so. Staying on top of the situation will take close attention to the following:

Employee relations. The better your contacts with your people, the more you will be able to help them over the rough spots—and vice versa.

Grievance procedures. Grievances are bound to increase. Review and, if possible, revise procedures to get them operating smoothly.

Communications. Keeping all your people informed of what's going on, and how they're involved in the changes, will help lessen their insecurity and anxiety.

Participation. Giving employees the chance to discuss common problems and make suggestions will satisfy their need to participate in the national effort.

"Business as Usual"

—is out! It will be the *unusual*, the *extra* effort that will be needed. War or peace, far-reaching changes are certain. Use these guidepoints:

1. Increase the individual contribution to higher levels by training, more complete instructions, "letting them in" on company objectives.

2. Step up the value of scarce equipment and materials by more careful utilization.

3. Get ready to make up manpower deficits with qualified people from usually-overlooked sources—such as older people and the physically handicapped.

4. Utilize the ingenuity of employees of all ranks to solve the "impossible" problems.

De-panning is now easy

Freezer trays empty fast

Silicones Speed, Sanitize Processes

Applied in numerous ways throughout food field, their use saves processing time, ups product quality, promotes cleanliness, minimizes clean-up tasks

T. A. KAUPPI

Manager Product Engineering, Dow Corning Corp., Midland, Mich. Photos Courtesy Peet Packing Co., Chesaning, Mich.; Saginaw Cold Storage Co., Saginaw, Mich.; Case Baking Co., Saginaw, Mich.; London Wineries, Canada

Food processors who "keep abreast" are now gaining a variety of new operational advantages—reduced maintenance, improved sanitation, increased output—through application of the versatile silicones.

As defoamers, coaters, anti-"stickers," insulators, and lubricants, these agents—resin-like materials in which silicon replaces carbon—are noted for their thermal stability, chemical inertness, and resistance to moisture and oxidation. Here are just a few of the things they are accomplishing:

- **Cutting froth losses in wine, syrup, jam processing.**
- **Eliminating pan greasing for bakers, meat packers.**
- **Avoiding sticking, wax build-up in heat sealing.**
- **Easing release of frozen foods from containers.**
- **Providing improved motor insulation in wet operations.**
- **Resisting heat, cold, acids while lubricating equipment.**

Ten years ago, silicones were unknown, except to a few research chemists. Today, most food processing engineers are familiar with silicones in one form or another.

The reasons are twofold: First, silicones speed things up. Some processes that formerly required hours are now done in minutes. Shortcuts which were previously impossible are now taken easily and at surprisingly low cost. Danger of mechanical breakdown during rush seasons has been reduced, and the elapsed time from raw ingredients to grocers' shelves has been substantially shortened.

Second, silicones keep things clean. In case after case, they have been used to cut maintenance costs. Equipment is staying cleaner longer. Wet, sloppy floors have dried out thoroughly for the first time in years. Walls and ceilings have blossomed out from behind coats of black, smoky grease. And laundry bills have dropped.

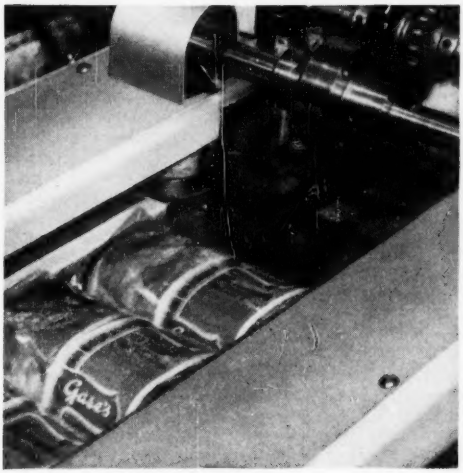
All these advantages may be traced to the properties of the silicones themselves. Not only at room temperature but also at temperatures as low as —100 deg. F., or as high as 500 deg. F. these products continue to look and act like ordinary fluids, greases, resins and rubbers.

In addition to stability over a very wide temperature span, almost all of the silicones are extremely water-repellent and have excellent resistance to hot oil and to most of the more commonly used chemicals. Applied to the surface of metal, glass and paper, certain silicones prevent the adherence of most sticky materials. Many silicone products are excellent electrical insulators.

Defoamer Leads the Way

The first product to demonstrate the usefulness of the silicones in the food industry on a broad scale was DC Antifoam A. Probably the most versatile of any foam-killer in aqueous systems, its stability at temperatures from —40 to over 300 deg. F. further increases its usefulness. Odorless, tasteless, and non-toxic, its occurrence in food products has been approved in quantities up to 10 ppm.

A Canadian winery was one of the initial users of this silicone defoamer. Great quantities of foam formed in its huge vats, especially during the initial fermentation period. This limited the capacity of the vats.



Wax doesn't build up

Iron works freely

The defoamer used previously was so acid that it burned workmen's hands and clothing on contact. Also, it was effective only in relatively high concentrations, and for a limited time.

Experience revealed that only trace quantities of the new product were needed to control foaming. In fact, a 10 percent dispersion (in any suitable solvent) of this silicone defoamer is now applied with a sprinkler-top bottle not much larger than a salt shaker. According to production figures, only 0.2 ppm. is required. Continued success of this application paved the way for full approval by several leading members of the Canadian Wine Institute.

Mixed With Carrier

This silicone defoamer is a viscous, honey-colored compound. For rapid dispersion in a foaming system, it can be mixed with a carrier, such as salt, granulated or powdered sugar, sugar syrup, or grain alcohol. Or it may be dispersed in a solvent or mixed with a small amount of one of the ingredients of the foaming material.

This antifoam is used in processing table syrups, molasses products, jams and jellies. At a concentration of only 1 part per 100,000, a dry dispersion of this silicone compound in sugar reduces foaming during the boiling of strawberry jam. In defoaming jelly, 1 part per 300,000 has been found satisfactory.

In processing sugar, the syrup is dried to the point of crystallization in a large vat under 26 in. of vacuum at 176 deg. F. Syrup enters from the bottom, filling the 14 ft. dia. vat to about 3 ft. above its conical floor. At this point, the vat contains 15,000 lb. of syrup and from 2 to 4 ft. of froth. Antifoam, added at a concentration of 0.1 ppm. in a sweet syrup dispersion, clears out the foam completely.

The non-toxicity of this silicone defoamer is demonstrated by the fact that it is used at the rate of 4 oz. per 7,000 gal. to keep yeast from foaming during fermentation, with no measurable effect upon the strength of the yeast itself.

To prevent coffee extract from foaming during bottling, a trace of this silicone defoamer is wiped with a soft cloth onto the inside of the bottle-filling funnel. One application is effective for about a month.

Molasses transported by tanker often becomes so thick that it can't be pumped out. And then when thinned by heating, it foams vigorously, overflowing the tanks and causing waste. This problem is now solved by spraying a dispersion of 4 oz. of the antifoam into a 4,000 gal. tank of warm molasses.

Other foods that now can be processed more rapidly through use of Antifoam A include concentrated orange juice, fruit juice solutions, chewing gum bases, and flavor extracts. For the latter, the defoaming agent is dispersed in ethyl ether and used in the arabic gum bases. Dispersed in powdered skim milk, it controls foaming during the processing of cheese.

Applied in Bakeries

The next most widely used silicone in the food industry is DC Pan Glaze, first introduced in the baking field. This is a silicone resin that can be baked onto metal surfaces—to form a highly-smooth, non-contaminating coating that prevents the adherence of most organic materials. With but one application of the glaze, a pan can be run through from 100 to over 500 bakes without greasing or cleaning.

Elimination of grease on the pans makes it relatively easy and inexpensive to keep bakeries spotlessly clean. Ovens, walls, equipment, and uniforms, stay cleaner longer. One large bakery reported savings of several hundred dollars in uniform laundry bills alone within a year after standardizing on the glazing. Best of all, the bread itself is free from the off-flavor formerly due to accumulations of rancid grease, and the crust is never marred by blackened bits of charred grease. Eliminated, of course, are the time and labor involved in cleaning and greasing pans.

At first, bakeries were required to operate their own glazing departments. However, much of this work has now been taken over by professional glazing services that can degrease and glaze or reglaze pans swiftly and expertly. Pan manufacturers are offering new pans already coated and ready for the oven.

Moreover, the business of these glazing services has been greatly stimulated by the introduction of Dowanol DC, a product expressly designed to remove the glazing from pans. Formerly, about 8 hr. of boiling in strong alkali cleaners was necessary to loosen the silicone film. But just 5 min. in a Dowanol DC Stripper Solution and the entire coating is easily flushed away with water. And this solution has no affect on the pans themselves.

The glaze alone is not always suc-

cessful with sweet doughs, but many bakers of cakes and rolls report that a light film of grease over the silicone coating not only provides instant release for hundreds of bakes, but simplifies pan cleaning. Only one-quarter to one-half of the usual quantity of grease is necessary, and the glazed surface lasts for months. Pans are easier to clean, and plant cleanliness is greatly improved.

Aids Meat Packers

Bakers are not the only users of this silicone surface. Meat packers are applying this silicone coating to meat loaf tins and they report getting as many as 80 bakes per application. Conditions vary among packers, but most of them find that this coating gives excellent release, simplifies the job of washing and drying pans, and eliminates the operation of pan greasing.

Meat packers also report equally good results with the material as a coating for aluminum smoke sticks. A single application lasts for 6 to 8 months, preventing corrosion and making the sticks much easier to clean.

This silicone coating also provides ready release for such apparently unrelated products as liver extract and frozen foods. In the frozen food industry, trays of bulk-frozen corn or peas were formerly rested in shallow pans of water to thaw the film of ice on the bottom of the tray. To release the frozen foods, trays were then vigorously banged against the hopper walls.

Naturally, the life of the trays was limited, food was wasted, and water was spilled over the floor. But today a silicone coating minimizes the adhesion of ice, and frozen food normally slides off the tray with very little sticking. Production time, a highly important factor in frozen food processing, has been cut to less than half, and water spillage has been reduced to a minimum.

This release quality is also found with other silicone products that have proved their usefulness in the food industry. These materials are used where a semi-permanent finish cannot be applied or where friction would cause a resinous coating to wear off rapidly.

Speeds Heat-Sealing Operations

In machines for heat-sealing cellophane or waxed paper, for example, silicones in either grease or fluid form are applied to the heating iron or bar. They prevent sticking and reduce the build-up of melted wax or plastic on the heat-sealing surfaces. In some cases, a film of DC Mold Release Fluid is wiped onto the heat-sealing bars with a soft cloth.

Life span of an application depends upon operating conditions. The heating surface stays clean and operates with maximum efficiency because the silicone film does not break-down to form a carbonaceous deposit, and because wax and plastics do not adhere. In most cases, a silicone compound known as Permaslip is used as a release agent for heat-sealing surfaces. This compound is somewhat easier to apply and generally more economical to use.

Again on the release characteristic: One part of another product, DC Mold Release Emulsion, in 10 parts of water is wiped onto the trays of an automatic oven unloader in bakeries. One application prevents sticking for over six months.

Wiped on the metal aprons used in manufacturing chewing gum, a silicone fluid prevents sticking and build-up. These surfaces formerly had to be cleaned off every three or four hours, now stay clean for as long as four days. Silicone fluid is also used as a release coating on wire mesh conveyor belts handling cereals through steam processing and surface drying.

Employed by Confectioners

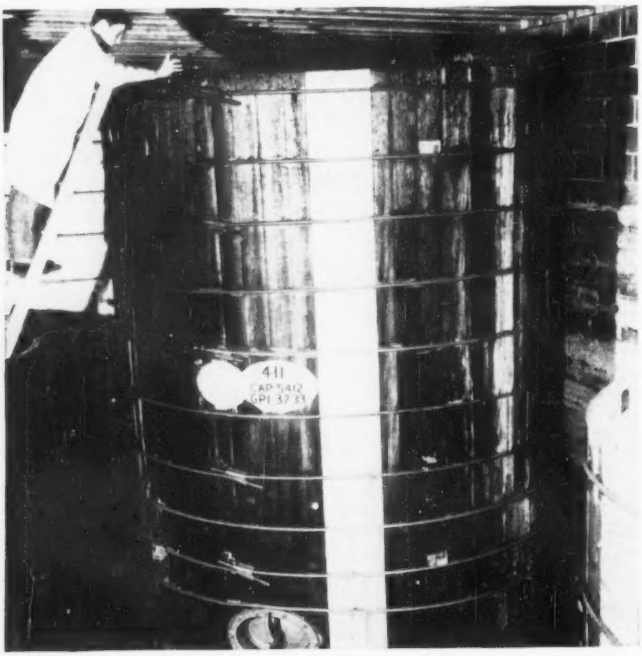
Beeswax used to be applied on the inside of copper and stainless steel kettles in candy manufacturing. But the wax melted at temperatures over 350 deg. F., hence a new coat had to be applied every time the kettle was charged. A silicone fluid is now wiped onto these kettles, because it is stable at temperatures above 400 deg. F. and it remains effective for three chargings.

Available in a wide range of colors and shades, silicone paint is extremely resistant to heat and corrosion. Bakers have found that when applied to the backs of cookie pans, black silicone paint helps absorb heat, speeding the baking process without injury to the pan or the finish. Aluminum pigmented silicone paint is used as a coating for the inside of fish steam-cookers. It provides release as well as protection when applied to the metal baskets used in cooking tuna. Greatly reduced is the waste previously caused by the sticking of fish to baskets coated with ordinary paint.

Silastic, a silicone rubber extentively used in the aircraft industry for high temperature gasketing, is now gaining popularity in the food industry as a permanent "release" surface. Bonded to cooking trays, it resists heat and assures easy release of hard candy, licorice, and chocolates. In

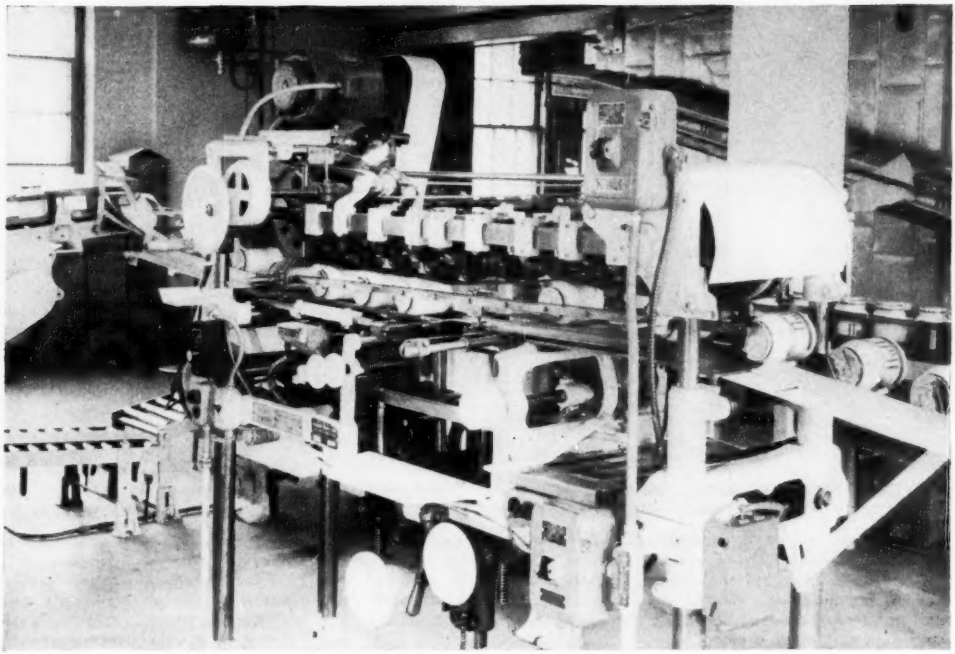
(*Turn to page* 194)

Defoaming Was First



WINERY operator sprinkles anti-foam silicones into fermenting tank. Only fraction of an ounce is necessary to completely eliminate the froth.

SPEEDS THE JOB: Volume Up Over 100 Percent



HIGH-RATE labeling machine handles 600 jars per min. Unit is similar to equipment on many canning lines. Jars are twisted (left), then roll between belts of wrap-around labeler, and are finally coded by heated plate.

You Can Double Output by Modernizing

New England confectioner proved it when he put in advanced units, adopted better handling, then tied the program together with quality-guarding innovations

JOHN V. ZIEMBA
Assistant Editor, "Food Industries"

Through the introduction of improved handling technics and greater mechanization, the new Durkee-Mower plant, in East Lynn, Mass., has more than doubled its output of Marshmallow Fluff—and with no increase in workers.

Daily production now exceeds 3,000 cases of 7½-oz. jars—12 to a case.

What's more, the changes have enabled the firm to strengthen its position during this highly competitive period. Also it is notable that the company has not raised the wholesale price of its product since 1941.

In addition to these production-increasing moves, other changes— precautionary measures—have been made to safeguard the quality of the product all along the line.

In all, seven important changes have been made in production:

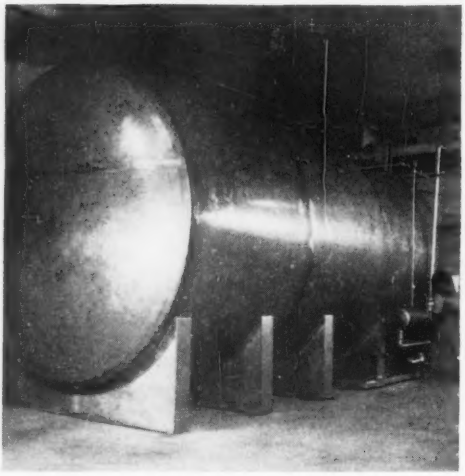
1. **Easily handled liquid sugar has now replaced the old 100-lb. bags.**
2. **More flexible facilities have been provided to handle corn syrup.**
3. **Double-handling of cases has been eliminated. Jars unloaded from cars are delivered to the filling and capping room and go directly back to the same cars.**
4. **Larger mixers, designed with automatic controls and timing devices, have been adopted.**
5. **Higher speed filling, capping, and labeling machines are now being employed.**
6. **Automatic coding units have been installed at the labeling and casing machines.**
7. **An automatic case-packer is now being used.**

First change on the processing line was the substitution of liquid for bulk sugar. Liquid sugar is delivered to the plant in tank trucks and then pumped into a 5,000-gal. tank. Everything in contact with this syrup is made of stainless steel.

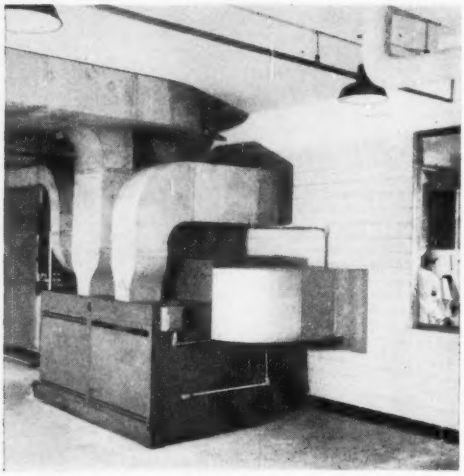
Two precautionary measures have been taken to keep the liquid sugar sterile. Ultraviolet lamps have been placed inside the tank, directly above the liquid-sugar level. These lamps are hooked up to red lights that warn the employees whenever the u-v lamps burn out. In addition vents on top of the tank serve to circulate air so as to eliminate condensation of moisture and subsequent spoilage.

Before the liquid-sugar handling system was adopted, 100-lb. bags of sugar were trucked to the plant. Men unloaded the bags and stacked them in a warehouse. Then, the bags were

Improved Operations Point Up the Fluff Line →



EASY-TO-HANDLE liquid sugar is used in place of sucrose. Stainless steel tank has u-v lamps and air vents.



AIR-CONDITIONING and dehumidifying units maintain proper temperature, humidity in mixing room (right).

removed from the stack, as needed, carried to the blending room, opened, and finally dumped into the kettles. All this handling had required two men, who worked about 3½ hr. a day, three days each week.

4-Way Syrup Handling

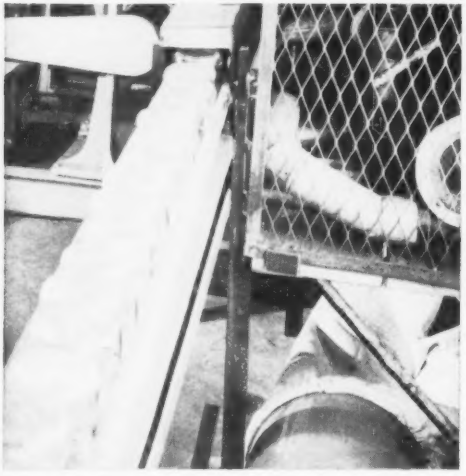
Next move was to provide more flexibility in the handling of corn syrup. A four-way handling system was devised. Syrup can now be gravity-fed directly from tank car into process, where it is blended with the proper amount of liquid sugar. Or, it can be made to flow into a 16,000-gal. L-shaped steel tank, equipped with steam coils on the bottom. The syrup can also be pumped from this tank into a 4,500-gal. auxiliary tank. And from the auxiliary tank, the syrup can also be pumped back into the larger storage tank.

With the present system, workers are not only assured of a constant supply of syrup, but costly delays occasioned in tank-car unloading have been eliminated. The corn-syrup tanks also have vents for circulating air over the syrup.

Handling of cases was the third notable improvement. Formerly, cases of empty jars were unloaded from box cars, stacked in the plant, and removed from storage when needed. Similarly, the cased goods were hand-stacked in the warehouse, later to go back to box cars.

These multiple handlings have now been omitted. Cars of empty jars are spotted, unloaded, and then the jars are filled with product, cased, and

These Are Key Steps in Safeguarding Quality →



EMPTY JARS coming from unscrambler pass through cleaning device, where dust is removed from them.

NEXT, clean jars pass under battery of ultraviolet lamps that sterilize them before they go to filler.

NEW Hobart mixer, first of its kind, fluffs 140-qt. batches. Unit has automatic controls and timing devices.

WITH Standard-Knapp unit, one girl packs 10 cases per min. Before, two girls hand-packed 5 cases per min.

immediately loaded into the same cars on the same day.

In the blending room, liquid sugar is pumped through stainless steel pipes into 50-gal. steam-jacketed kettles that are also stainless steel. At this point, 67-deg. Brix liquid sugar is boiled to drive off excess moisture. Temperature recorders show the attendant when to terminate the cooking of the liquid sugar.

Corn syrup is then added and blended with the liquid sugar. Blended syrup next goes to a stainless steel holding tank, from which the mixing room draws its supply.

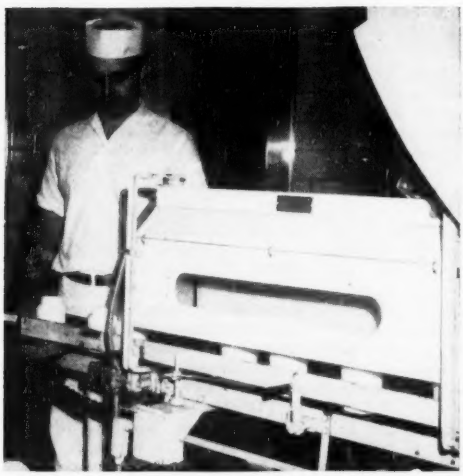
Still Better Mixing

Fourth change—improved mixing—is another significant advance. Capacity of the mixers has been increased from 80 to 140 qt. And these units, the first of their kind, are equipped with automatic timing. There are also facilities for raising and lowering the mixing bowls. The dial on each timing device can be set at ½-min. intervals, to a maximum of 30 min.

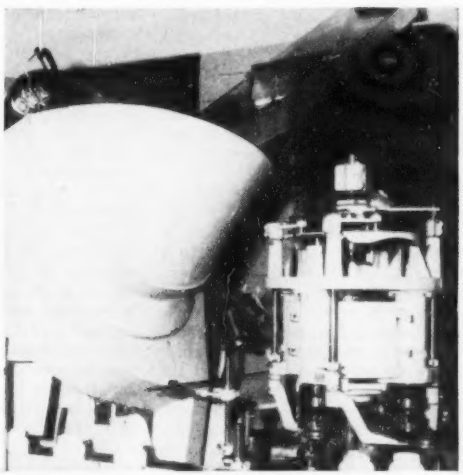
Very little manual labor is required to operate the mixers. A lever is thrown and the mixing bowl is raised by motor to the level of the beater. Next, the pointer on the timing device is set for the desired mixing time. Then, a starter button is pressed and the mixture of blended syrup, egg whites, flavor, and other ingredients, is whipped.

After all the ingredients have been mixed for the required time, the machine stops and the bowl lowers auto-

(*Turn to page* 192)



THEN another set of ultraviolet units sterilizes the surface of the product and the top of each jar prior to capping.



FINALLY, any wax and pieces of cap liners are removed as lids are chuted over grid and into disk feeding capper.

CHEMICALS vs. FOODS: Round Two

Food industry witnesses are in accord with aims to safeguard foods and food products against every possible harmful effect of chemical ingredients

REPRESENTATIVES from the U. S. food industry, appearing before the Delaney committee in Chicago, last month, placed particular emphasis on the advisability of shifting the proof of non-toxicity of materials used in foods from the Food & Drug Administration to the manufacturers of the materials. These food producers were unanimous in favoring caution where added materials are concerned, while there was some division on emulsifying agents and spray residues on fruits and vegetables.

Roy C. Newton, vice-president in charge of research, Swift & Co., Chicago, recognized the possibility that rapid developments in chemistry may present hazards if new developments are rushed into production without adequate biological testing. Processors of food, he said, must observe precautions and meet requirements not generally encountered in the manufacture of non-food materials. The food processor, he added, has a moral obligation not to change the food supply by addition of chemicals or by chemical processing until he provides adequate proof, in the form of scientific studies by competent scientists, that the proposed change or addition is non-toxic. He thought scientific studies should include investigations of acute toxicity, sub-acute toxicity, and chronic toxicity.

Insecticide residues, defoliant residues, and plant hormones are regarded with as much precaution for toxicity studies as chemicals deliberately added to foods.

Favors Revision

Dr. Newton observed that circumstances in public interest seemed to warrant revisions of the Food, Drug & Cosmetic Act to provide a clear and decisive statement of requirements necessary to secure approval for the use of chemical substances in connection with foods. He thought the wording of the revision should protect the consuming public and be clear in its provision to protect the processor against arbitrary rulings, of an administrator, which could be unscientific and unsound from a practical standpoint and against public interest by impeding technological progress.

William B. Bradley, scientific director, American Institute of Baking, Chicago, cited the use of chemicals in food production and processing to be a useful practice. However, he differentiated between chemicals according to their functions. Enrichment of bread was offered as an example of a practice beneficial to the consuming public, to the food processor, and to

ROY C. NEWTON recognizes hazards in use of new chemicals in foods

the chemical manufacturer. Use of chemicals as "extenders" of, or substitutes for, normally used nutritive ingredients is considered to be beneficial only to the chemical manufacturer and in some cases has been found deleterious to public health.

In Dr. Bradley's belief, the best interest of the food-consuming public can be served through revision of the Federal Food, Drug, & Cosmetic Act providing for adequate testing and submission of data by the chemical manufacturer of new chemicals proving their non-toxicity and function before their use in the production or processing of foods is permitted. He advocated that the revision also provide for review of evidence of safety and function of each of the various chemicals currently in use.

Dr. Bradley also believes that evidence of function and request for permission to use a particular chemical in a food should come from representatives of the food processor and not from the chemical manufacturer. Evidence of safety, to be supplied by the chemical manufacturer, could consist of reports from two laboratories—one an industry laboratory, and one an independent laboratory recommended by F&DA. Safety data could be obtained by controlled feeding of experimental animals of more than one species over a period of one to two years and at levels at least 10 times that likely to be in the human dietary if use of the chemical is permitted in foods.

Dr. Bradley suggested a revision of the FD&C Act to establish a procedure in which the F&DA would act as advisor to the chemical and food industries.

L. E. Caster, president, Keig-Stevens Baking Co., Rockford, Ill., expressed approval of the position taken by the American Institute of Baking that the use of "softeners" in bread should be delayed until they are proved harmless. He admitted using them until they were excluded from the proposed standards for bread. At that time they were replaced by another type that is recognized in the proposed standards. "Soft" bread is made for competitive reasons, because consuming public buys it in preference to firm bread.

He does not believe that the "softeners" add anything to bread beyond making it feel soft, and he approves revision of FD&C Act to provide for an advisory board to the F&DA to pass on or make recommendations concerning use of new chemicals and ingredients in foods. He believes that the burden of proof of non-toxicity should be on the chemical or ingredient manufacturer.

G. F. Gauger, president, Purity Baking Co. of Illinois, Decatur, Ill., reported sales benefits from using chemical "softeners" in bread and cited recommendations of approval from Quality Bakers of America as a basis for their inclusion in his bread formulas. He also favored revision of FD&C Act to place responsibility for non-toxicity proof on chemical manufacturers as a protection to both the food processor and the consuming public.

Eugene McAuliffe, Glyco Products

Co., reported on sales of his company's polyoxyethylene stearate and growing use in bakery products since 1947. Sales have held at an approximately uniform level since publication of proposed bread standards excluding the use of the polyoxyethylene emulsifiers and softening agents. He also reported results of 90-day and 2-year toxicity tests showing only a low order of toxicity. He stated that his company fostered sales to bread bakers only after two years of testing and obtaining an approval from Mellon Institute of Industrial Research for use in food products.

Cake Mixes

F. N. Peters, vice-president in charge of research, Quaker Oats Co., Chicago, stated that "fool-proofness" is the No. 1 property looked for in commercially prepared cake mixes, with appearance and texture in the finished cake of second importance, and flavor of third importance. "Fool-proofness" is obtained through the use of emulsifiers, as such or as incorporated in the shortening used. He reported that the addition of emulsifiers to the mix also increases the volume of the finished cake and that 6 percent shortening plus emulsifier gives more "fool-proofness" and volume than does a higher percentage of shortening without emulsifiers.

He carried on feeding tests with albino rats through three generations and found no histological evidence of any toxic substances in the diet. He was in favor of having the burden of proof of non-toxicity placed upon the chemical manufacturers, but cautioned that projection into the future of the effect of what is being done today is impossible. He hoped that nothing will be done legislatively to stop progress in food technology.

George T. Carlin, baker and bakery chemist, Swift & Co. Research Laboratories, Chicago, reported that creaming properties of butter vary with its mono-glyceride content and that lard has poor creaming property and low mono-glyceride content. He cited development of surface-active chemicals that affect the structure of cake batters and make aeration possible in batters of unusually low fat content. He identified these chemicals as polyoxyethylene compounds and as being more economical to use than mono-glyceride products, which require the use of liberal quantities of fats to produce salable finished products.

Edward Eagle, physiologist and toxicologist, Swift & Co. Research Laboratories, testified that Swift has adhered for many years to the policy of subjecting new or unusual chemical agents to toxicological and nutritional evaluation on lower animals prior to using them in or on food products. He thought that food processors, proposing to use a new non-food material, should be required to test the material to assure adequate evidence of innocuousness in the human diet. Need for emphasis on chronic, long-range studies on low animals was expressed with recommendation that they be at sufficiently high levels to bring out cumulative effects and to insure a wide margin of safety.

Dr. Eagle reported results of nutritional, physiological and toxicological studies carried out in Swift laboratories on polyoxyethylene monostearates and polyoxyethylene sorbitan monolaurate, using controls fed on diets containing equivalent levels of mono- and diglycerides. The tests on hamsters, rats, and rabbits showed no pathological conditions.

Draws Parallel With Drug Testing

B. S. Schweigert, Division of Biochemistry & Nutrition, American Meat Institute Foundation, and Department of Chemistry, University of Chicago, expressed the firm opinion that the FD&C Act should be amended to prevent the addition of new chemicals to foods until extensive toxicity studies are carried out. Testing of substances for foods, he said, is as important as testing new drugs, because chemicals added to foods are consumed by the entire population and

(*Turn to page* 192)

Proposed Amendments

Here is a condensation of the amendments to the Food, Drug & Cosmetic Act, as proposed by C. W. Crawford, deputy commissioner, FSDA, at the Washington hearings, which were resumed on November 28. They represent additions or rewordings of various sections of the Act.

The term "chemical additive" is defined as any substance (including products resulting from changes in such substance after use) to be used: (1) To preserve or alter any food or food characteristic; (2) in substitution, wholly or partly, for any food or food ingredient; or (3) as a pesticide or for other purpose in producing, processing, packing, or holding food if such use is likely to result in contamination of any food.

These additives are to be regulated (1) when they are not generally recognized, among qualified experts, as having been tested to show that they are not poisonous or deleterious; or (2) when, if poisonous and deleterious and intended for use in the production of food, they are not recognized by qualified experts as having been tested to show that they are safe for such use.

To introduce any chemical additive into interstate commerce, an application must be filed with the administrator submitting: (1) full reports of investigations made to show the toxicity of the additive; (2) a full statement of its composition; (3) a full description of methods of analysis for the quantitative determination of such chemical additive in or on food, including animal or plant tissues if stored therein; (4) such samples as the administrator may require; (5) all directions, recommendations, and suggestions proposed for the additives use; and (6) if the additive is proposed for use where a poisonous or deleterious substance is required, full reports of investigations made to show the quantities of additive remaining in or on the food.

After an application has become effective, the applicant may file a supplemental application setting forth any proposed change in directions, recommendations, or suggestions for the use of the additive, or any other information contained the effective application.

Application or supplement will become effective in 60 days unless the administrator issues a notice of hearing. By notifying the applicant, the administrator may make the application effective at an earlier date, or may postpone the effective date, for further study. Postponement, however, shall not be more than 180 days after filing.

If for specified reasons the administrator finds the application unsatisfactory, he may refuse to permit it to become effective.

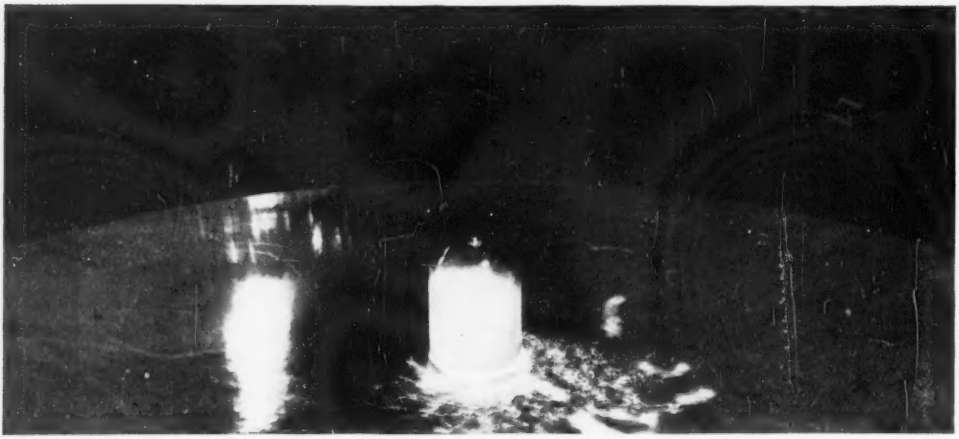
An already effective application may be suspended by the administrator for specified reasons, after due notice and opportunity for a hearing to the applicant, but the administrator's order must state the findings upon which the suspension is based. The applicant may, at any time thereafter, petition for termination of the suspension. The administrator then must terminate the suspension, unless he finds that adequate measures have not been taken to comply with the provisions of the application.

An order of refusal or suspension shall be revoked whenever the administrator finds that the facts so require.

An applicant may appeal from such orders by filing in the U. S. Court of Appeals (within the circuit in which he resides or has his principal place of business, and within 60 days after the entry of the order) a written petition specifying the grounds on which the order of the administrator should be set aside. The judgment and decree of the court, under specified conditions, shall by final, subject only to review by the U. S. Supreme Court.

Chemical additives intended solely for use by qualified experts to investigate their toxicity and usefulness are exempt from these provisions.

WITH NEW DEVICE: Little turbulence at lower level . . .



ENTERING TANK at 4,400 gal. per hr., liquid creates very little foam. Highlight (left) shows calmness of surface.

Glass Baffle Balks Air, Betters Product

It keeps down agitation during tank filling—thus minimizes aeration of beer to safeguard its flavor and foam . . . Benefits seen with other liquid foods

ALBERT C. SMITH
The Lion Inc. Brewery, Wilkes-Barre, Pa.

A reduction of over 50 percent in air-gain of beer during tank filling operations, and a marked lessening in foaming due to the elimination of turbulence, have resulted from use of a special bell-shaped glass baffle.

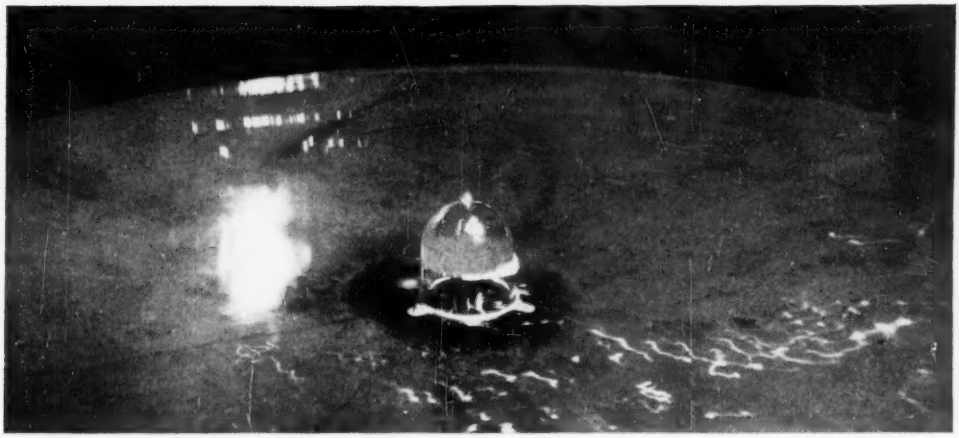
■ **Since the oxygen in air is detrimental to beer's taste, and since excessive foaming removes essential constituents, success of this baffle device has brought a decided improvement in the quality of the beer.**

Modern brewing processing emphasizes minimum quantities of dissolved air in the beer throughout its post-fermentation period of aging, finishing, and packaging. This is because the oxygen in air combines with constituents in beer, causing it to deteriorate and entailing loss of the beverage's "fresh" aromatic character. A rough analogy is found in the progressive deterioration of coffee flavor as oxygen takes its toll.

WITHOUT IT: Much turbulence at low level . . .

THERE'S VIOLENT agitation when new device isn't used. This photo was taken at same flow rate and level as above.

. . . still less at high



AS LEVEL RISES, non-bubbling flow is established within baffle, and so liquid's surface becomes even smoother.

Foaming is also to be avoided within the brewery. For it is undesirable both from the mechanical and sanitary standpoints, necessitating extra cleaning of vent pipes and other equipment. Also, the beer loses permanently, in this foam, some of the essential constituents needed for good foam at time of ultimate consumption.

Since brewing is basically a batch process in which brews progress through the brewery at intervals there is considerable transferring from tank to tank before the finished beer reaches the consumer package.

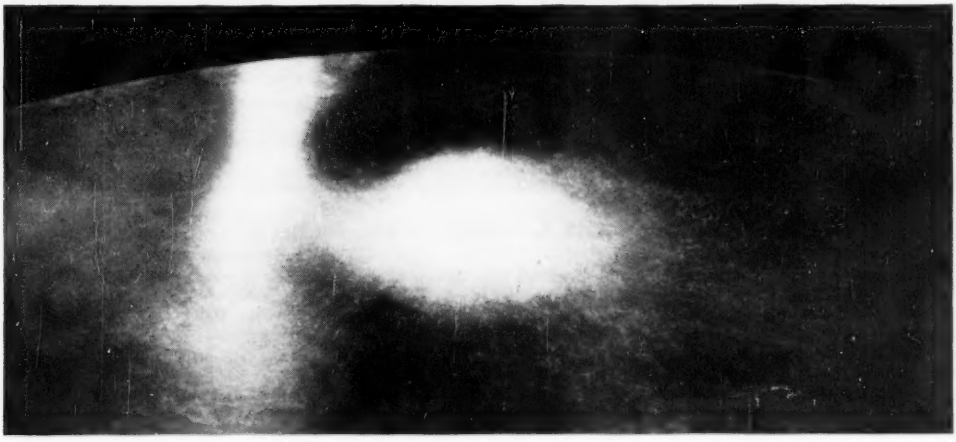
During these transfers from tank to tank, the beer moves at flow rates ranging from 2,000 gal. per hr. in the smaller breweries up to about 10,000 gal. per hr. in the larger plants. In either case, when it enters tanks at such flow rates there is generally a great deal of turbulence with consequent aeration and foaming.

The photograph at the left, below, shows the turbulence of water entering a 10,000 gal. tank through a 2 in. diameter opening at a flow rate of 4,400 gal. per hr. at the instant that 60 gal. of throughput registered on the meter. Photo at right, below, shows conditions 3½ min. later when 310 gal. were registered on the meter. These hydraulic conditions are typical of a medium-size brewery.

In the studies by the author, wherein the turbulence illustrated was encountered, the air absorbed by the beer was found to be confined to the first 4 ft. of tank fill. Beer subsequently sampled as filling progressed beyond this level showed a continuously decreasing air content in proportion to the dilution factor of the incoming beer and its fixed air content. The overall air absorbed in a typical tank filling operation ranges from 0.7 to 0.9 ml. per liter of beer (into beers having an air content range of 1.6 to 2.5 ml. of air per liter before entering the tank). Since many brewers

Turn to Next Page For Baffle Closeup →

. . . still some at high



THOUGH SLIGHTLY reduced as level rises, excess churning is still apparent (flow rate and level same as above.)

strive to keep dissolved air below 3.0 ml. per liter, an air gain of 0.7 to 0.9 ml. is significant.

Having concluded, from both visual observation and mathematical calculations, that turbulence was responsible for the absorption of air by beer during tank filling, the problem presented was how to overcome this turbulence. Trials with conventional baffles produced negative results.

Ultimately, a practical fluid baffle was developed. It works on the principle of completely reversing the flow of incoming liquid and reducing its velocity about 80 percent. Base of the baffle is a typical 2-in. tank fitting. Three stainless steel support legs, threaded at each end, screw into the fitting. Above they are bent to form a carrier for the baffle. The baffle itself resembles a glass bell jar with an enlarged lip at the bottom. It is held firmly in place by a slip ring that bolts to the supporting legs.

Diameter of the baffle is about 2½ times that of the inlet opening. It has small vent holes at the top to permit displacement of entrapped air. When mounted in a steel tank, the tank shell is drilled and tapped and the support legs are screwed directly to it.

Our photograph at the top of the title page shows the fluid baffle in operations under filling conditions identical with those represented at the bottom of the page—i. e., 4,400 gal. per hr. flow rate and at the moment 60 gal. registered on the meter. It will be noted that the initial turbulence is now confined pretty much within the baffle and, as indicated by the highlights to left, liquid surface is calm.

Here It Is

FLUID BAFFLE is comprised of a glass bell with large lip at bottom, mounted above standard 2-in. tank fitting (on 3 stainless steel legs).

The top photo on the second page shows filling conditions comparable to those of the counterpart photo below—that is, 4,400 gal. per hr. flow rate and 310 gal. registered on the meter. Streamline flow is now established within the baffle whereby the direction of flow is reversed and slowed down, resulting in a calmness on the surface of the liquid. It is reasonable to suppose that some such calm condition is reached without the baffle when the tank is filled to a depth of about 4 ft. and air-gain stops.

Improvements resulting from the use of this fluid baffle in tank filling operations have been twofold. First it has accomplished its primary purpose of reducing air-gain during tank filling operations—as stated, by at least 50 percent. Second, there is less foaming. The latter is a logical accomplishment with the elimination of turbulence.

In the author's experience, these baffles have proved themselves in all storage, finishing, bottling, and racking tanks of a medium size brewery. The principle should be of interest to other fluid processors who for one reason or another seek to eliminate turbulence during tank filling operations.

Patent has been applied for and manufacturing and sales rights have been assigned to Schock, Gusner, Inc., of Hoboken, N. J.

YOU CAN'T ESCAPE THE LAW (OF GRAVITY)!
You can take our word for it that anything you throw away will not land on the ceiling. So please put trash in the receptacles provided, not on the floor. Let's keep every part of this bakery neat, clean and tidy just to show the whole world what a really clean plant looks like.
KEEP IT CLEAN!
KEEP IT CLEAN!
Clean hands, clean equipment and a clean work-place are essential to the cleanliness and fine reputation of our bread. Please make sure your hands are clean before touching bread dough, flour, or any other ingredient.
LET'S KEEP THINGS "DRESSED UP."
You don't have to wear your soup and fish when you work in this bakery. But we'd like to keep everything so neat and clean that all of us could wear our white ties and tails if we wanted to, and still be as clean as a whistle at the end of a work day.
KEEP IT CLEAN!

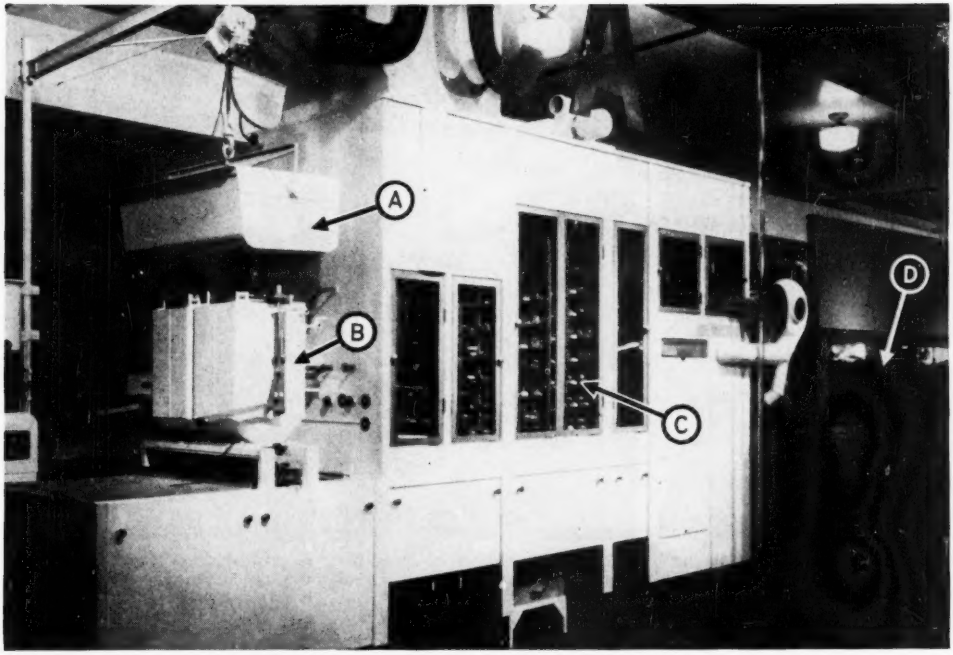
Posters Sell Workers on Cleanliness

MR. "KEEP IT CLEAN," the rather portly cartoon-type personality pictured above, has solved the age-old problem of bakery cleanliness, according to a whole slew of Pacific coast bakers. That is, his appearance on a complete series of semi-humorous posters, backed up by smaller versions used as pay envelope stuffers, has made bakery workers cleanliness conscious. And it's done it without antagonizing them.

Earl O. Schnetz, president of Old Home Bakers, Sacramento, Calif., thought up the idea, and Emil Reinhardt, Advertising, of Oakland, put it into effect. Other coast bakers quickly picked it up. Mr. Keep It Clean is placed in a variety of amusing situations, each satirizing a condition likely to appear in a bakery. Posters are 16x22 in. and are placed in frames throughout the bakery.

Talking about his own bakery, Mr. Schnetz says, "Things have developed to the point where our employees are not only heeding the messages we present, but actually are asking when the next poster will come out. They're taking more pride in keeping themselves and their work-places clean—and more pride in producing good bread than they did before, too."

Record Straight-Line Performer



DOUGH is dumped from trough (A) into hoppers of extruder (B), where it is automatically cut into pieces that then go to proofer (C) and fryer (D). Continuous glazing and cooling of the finished doughnuts follow right in this same machine. Finally, doughnuts are hand-packed into window-type cartons.

Quality Doughnuts—*At 700 Doz. an Hour*

Latest high-speed equipment continuously extrudes and cuts dough, then proofs, fries, glazes, and cools it into uniform product

ZENAS BLOCK
Director of Research & Development, Doughnut Corp. of America, New York

Fully automatic production of better quality yeast-raised doughnuts—at the rate of 700 doz. per hour—can now be attained with the Doco-streamlined unit recently developed by Doughnut Corp. of America, of New York City.

Bakery installations are currently going forward from coast to coast.

The new unit mechanically extrudes and cuts fermented dough into uniform pieces. These are then screened, proofed, fried, glazed, and cooled. Eliminated are dividing, bench resting, sheeting, and flour dusting.

Only 1 worker is needed to operate the machine and 4 to 5 to pack the doughnuts. Total space required for the doughnut-making unit is 33 x 90 ft. and a minimum height of 11¼ ft.

Three principle advantages are seen in making yeast-raised doughnuts by the new process—

1. Labor costs are reduced to one-quarter of those entailed with semi-automatic methods.

2. Conditions that attribute to variations in the shape, size, and texture of the doughnuts; color of the crust; amount of fat absorbed; and instability of the glaze can be readily controlled.

3. Cleaning of various parts of the doughnut-making unit is simplified.

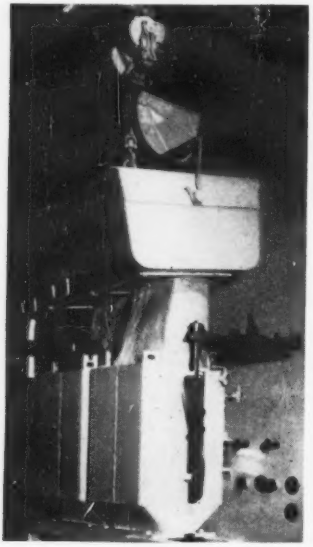
Yeast-raised doughnuts are highly acceptable to consumers, yet have not attained the distribution indicated by their popularity. There are several reasons for this: Labor costs have been too high; bakery cleanliness is difficult to maintain because of glace drippings; and each unit operation is subject to wide variations, resulting in non-uniform products. Moreover, wholesale distribution has been difficult due to the instability of the glaze.

Start of Process

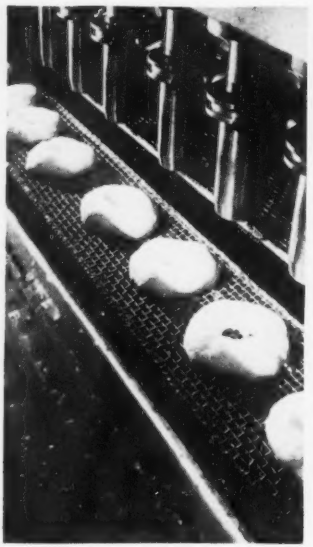
Now about making yeast-raised doughnuts by the continuous method: A prepared mix, requiring the addition of yeast and water, is customarily used. Depending on the mix, water absorption is 45 to 52 percent, and yeast 4½ to 5 percent, based on the weight of mixture. Ingredients are blended in a high-speed bread mixer. Then, the dough is dumped into a metal trough.

Fermentation is next. And here a significant variation from other proc-

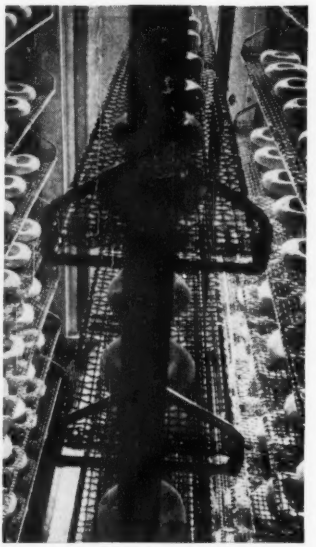
From Fermented Dough to Packaged Doughnuts →



1 HOIST on overhead track lifts trough of dough for feeding into hoppers of automatic extruder-cutter.



2 EXTRUDED under pressure, fermented dough is cut into eight pieces that drop on conveyor.



3 DOUGH makes 30-min. up-and-down travel through proofer in which heat and humidity are controlled.

esses is the shortness of this step—30 min. Dough temperatures from 80 to 86 deg. F. are encountered. The shape of the finished doughnut may be regulated by manipulation of dough temperature. Increased temperatures give a higher crown and less spread in the finished product. No dusting flour is used.

Cutting follows. A hoist, mounted on an overhead track, lifts a trough-load of fermented dough for feeding directly into the hoppers of the cutter. The dough is dropped into the unit by removing a slide from the bottom of the trough. Then, the hopper cover is swung over and locked. Compressed air is used to build up 30 to 50 psi. of pressure in the hoppers.

Slicing is started by engaging a clutch for the cutters. There are eight cutters, four for each hopper. Dough, extruded under pressure and then sliced, drops on traveling screen strips. Speed of cutting and travel of the screens are synchronized.

The weight of the pieces of dough is closely controlled by regulating the air pressure with the aid of two valves, one for each hopper. Cutting speed is also adjusted by a variable-speed drive—the range being 10.50 to 14.75 doz. per minute.

The cutter, proofer, and fryer are all commonly driven, so that regulation of the speed of the cutter (slower for heavier doughnuts) adjusts the balance of the system.

Extrusion-cutting eliminates five major problems encountered by the die system—

1. The doughnut is extrusion-cut to weight, rather than size. Weight control is quite accurate, with ±5 percent usual between individual doughnuts and ±1 percent practical over one dozen of them. When dough is sheeted and die-cut, its density may vary, resulting in doughnuts differing in weight and size.

2. Scrap dough is reduced to a minimum. Using die-cutting methods, the scrap may vary from 12 to 40 percent of the weight of the dough.

3. Consistency of the dough can be easily controlled. Mixing errors are quickly picked up if too little or too much air pressure is required.

4. Non-uniformity due to the age of the dough is reduced because of the speed of the operation.

5. And non-uniformity due to spring back of dough is eliminated.

Cutters for ring doughnuts, jellies, and sticks may be interchanged in 15 to 20 min.

Extrusion cutting, however, does create a problem of its own. This is the difficulty of taking a raw cut of dough to form a smooth gas-retaining film before frying. However, it has been solved by running the pieces of dough through a continuous proofer.

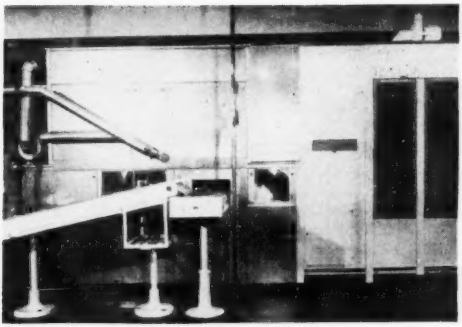
Proofing is the succeeding step. In addition to leavening and relaxing the cut pieces of dough, the continuous gas-heated proofer forms the film or skin just mentioned. To do this, water is evaporated at a rate which will produce a flexible, smooth film at the same time that the doughnut is three-quarters to fully proofed. This process requires temperature and humidity control.

Proofing is extremely important in the Doco process. Excessively humid proofing causes too much fat absorption and spread. In addition, the dough sticks to the screens. On the other hand, excessively dry proofing limits volume and causes a rough, split crust. The skin of the doughnut is evident any time during proofing. And the temperature and humidity of the proofer can be controlled to produce the smoothness and pliability required.

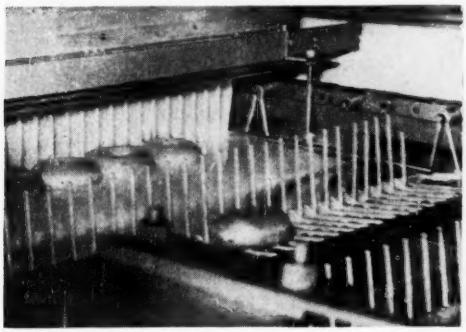
3-Step Frying

Frying is a three step operation—feeding pieces of dough into the hot fat, turning them, and removing the doughnuts from the fryer. Each of these steps can influence the amount of fat absorption. Rough handling will rupture the surface of the dough and facilitate the entry of fat. Uneven turning of the doughnut results in variable frying times and hence changes in fat absorption and the color of the crust. Delayed removal from the fryer causes excessive fat absorption and an undesirably dark and non-uniform crust color.

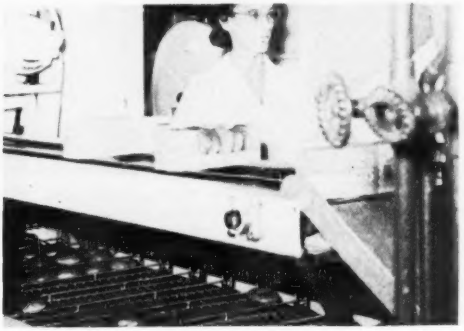
4 **AFTER PROOFING,** doughnuts are first fried on one side. Device (left) turns them to complete frying.



5 **DISCHARGED** from fryer, doughnuts next go to automatic glazing unit (left) and then to cooler (right)



6 **L-SHAPED HANDS** carry uniformly fried doughnuts through curtain and bath of glaze prior to cooling.



7 **COOLED DOUGHNUTS** finally go to the packaging station, where they are hand-packed into window cartons.

The fryer used in the Doco process is timed with the cutting and proofing operations. Proofed doughnuts are blown into the fat by an air current. A row of doughnuts is then fried for the same period, turned for frying on the other side, and discharged.

The operator only has to regulate the frying temperature to get the crust color desired. A frying-temperature range of 375 to 395 deg. F. is usually satisfactory. Lower frying temperatures may cause the doughnuts to collapse during glazing and to absorb too much fat.

Subsequent step is glazing. Doughnuts are discharged from the fryer onto a slatted metal conveyor, which feeds them into the continuous glazer. The latter is equipped with a temperature-controlled tank (oil jacketed), a pump, and a glaze hopper. Glaze is fed into the tank from a steam jacketted, agitated kettle, as required.

Doughnuts are picked up from the fryer-feed conveyor by an L-shaped hand and carried through a curtain glaze and also a bottom bath of glaze. Then, they are transferred to another hand and delivered through a hot air blast for rapid evaporation and set of glaze. Finally, the doughnuts go to the cooler.

The temperature and thickness of the glaze curtain are easily regulated. In order to avoid collapsing of doughnuts and to obtain a clear, shiny glaze, a minimum temperature of 110 deg. F. is recommended.

To obtain acceptable glaze stability, an adequate quantity of the coating should be applied—approximately 4 to 5 oz. per dozen doughnuts. Further stability is assured by holding the moisture content of the glaze to 17-19 percent, preferably 17 percent (on total percentage basis). Cold glazing is often responsible for collapsed doughnuts, regardless of the process employed.

Chilling is the next operation, with the doughnuts going into a cooler operating on a 30 to 40-min. cycle.

Purpose of cooling is to set and evaporate water from the glaze to a 9 to 10-percent level, and to chill the doughnuts to room temperature before they are packed. A frequent cause of an unstable glaze is packing the doughnuts before they are cool. The Doco cooler comprises a chamber, with controlled air movement. The doughnuts move through on carrier hands.

Final step is packing. The cooler hands travel past a packing section, from which the doughnuts are hand-packed into cartons. This is the only handling in the entire process, resulting in practically no damage to the product. This means a saving in the scaling weight required to fill standard packages, as well as a more attractive finished product.

Quality Control Measures

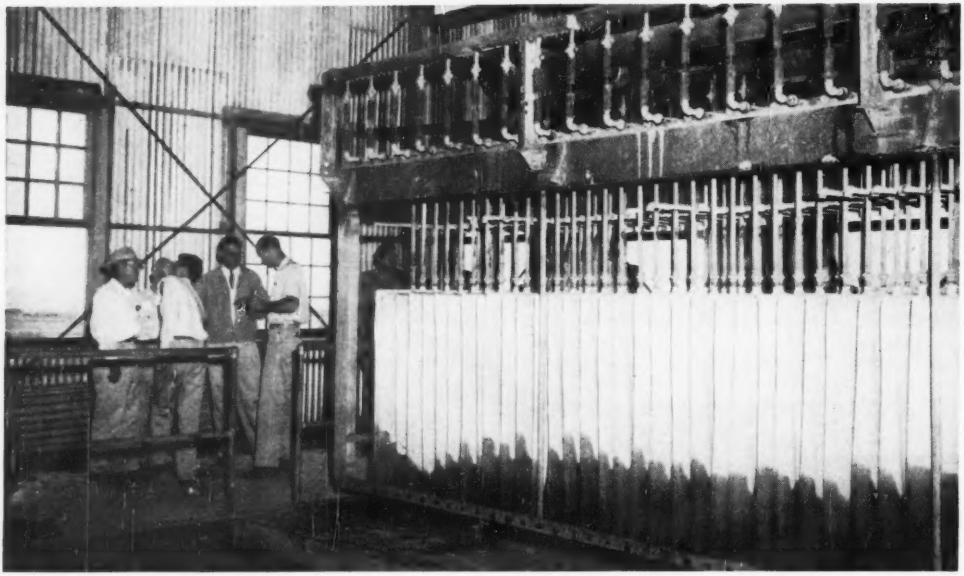
Now let us take up the steps in controlling the quality of yeast-raised doughnuts:

Shape. All factors leading to rapid or excessive fermentation (percentage of yeast, dough temperature, and proofing time and temperature) lead to high crowns and ultimately "bally" doughnuts. The shape of the doughnuts is also influenced by the amount of water in them and the humidity during proofing.

Volume. To retain CO_2-gas, doughs must be completely developed, smooth,

(*Turn to page* 196)

Filter That Plays a Vital Role



THIS IS THE WAY hydromatic filter appears when withdrawn from tank. It consists of 46 leaves made of Nylon. Internal coils keep them spread during suction. Reversing air flow through leaves drops solids fast.

Powder Clarifier Recovers More Sugar

—With These 6 Benefits Cited:

Yield	**Up 5 to 8%**	**Processing Time**	**Hours saved**
Polarization	**Reaches 99.87**	**Crystallization**	**Accelerated**
In-plant inventory	**Lowered**	**Evaporator scale**	**Reduced**

ROY E. BERG
Chemical Engineer, New York City.

Greater recovery, higher polarization, faster processing time with accompanying lower in-plant inventories, and reduced boiling house troubles are reported achieved with a new sugar clarifying process employing a powder. It is now in continuous operation at the Grove Farm Co.'s Koloa Mill in Hawaii.

Of singular interest is the fact that this mill, first to adopt the new system, is the oldest in the Islands.

■ **The powder-processed cane juice shows a definitely increased yield of sugar—approximately 5½ to 8 per cent more than is recovered when lime is used.**

Known as the Elguanite Process, the clarifying technic was developed by J. J. Naugle, president of Elguanite Corp., 120 Wall St., New York City. Its successful installation at Koloa culminates ten years of patient research for a more efficient method of defecation and clarification of raw juice from sugar cane and sugar beets.

Milk of lime, which has been universally used as a sugar defecator since 1685, is not used here. In its place is substituted a dry white compound made up from specially processed earth metals, in the form of carbonates, hydroxides and oxides, and a number of trace elements which, when added to raw sugar juices, effects purification. This powder performs a three-fold operation. It acts on the juice as a clarifier, a precipitating agent, and a filter aid. In short, it performs both as an absorber and as an adsorber.

Net result, after treatment with the powder, is a brilliantly clear juice. This product issues from the patented hydromatic filter used in conjunction with the new process.

The powder is a homogeneously blended group of compounds, the principal one made from a magnesium base. Each of these compounds has been scientifically determined as a necessary ingredient to react with the 20-odd others, exclusive of sucrose, dextrose and levulose compounds which constitute the composition of raw cane juice. Practically white with a slightly pink cast, the powder has a powerful affinity for the collodial coloring bodies which are natural to raw solutions of cane and beet sugar.

Reaction of the powder with cold juice produces from the impurities in the juice a floculent precipitate of the

inorganic impurities. To the latter cling the organic materials simultaneously thrown down as microscopic nodules in a discontinuous structure. Defecating and precipitating action of the powder is distinctly different from action of lime. This is particularly noticeable in the Hawiian Islands, where the cane growers are now committed to modern mechanical harvesting methods that entail more foreign materials with the cane.

Powder is added to the cold raw juice in the proportion of approximately 2½ to 3 percent of the sugar solids in the juice. Temperature of the juice is then raised to a point ranging between 79 and 95 deg. C. (174 and 203 deg. F.). Time of contact at the elevated temperature ranges from 5 to 15 min.

Because of the wide variation encountered in different types of juices and in the impurities entrained in the solutions, there is naturally a difference in the response to the new agent. This is also true with lime. But it has been found that a greater range of types of juices and a wider scope of impurities can be handled with a smaller range of the powder.

Five Variability Factors

The important factors in raw juice variability follow:

1. Refractory juices from certain types of cane, such as POJ 2878, require special consideration.

2. Method of harvesting determines to a large extent the quantity of dirt, trash, and colloidal particles entrained in the juice.

3. Character of the soil in which the cane or beets are grown.

4. Fiber content and its particle size.

5. Nitrogenous bodies, plastics, waxes, resins, and gums.

Because of these and other considerations, the quantity of powder added to the juices, the temperature, and the time of contact, are varied in order to obtain optimum results.

When lime is used as a defecant, a gelatinous precipitate is formed which must be settled from the juice in the usual clarifiers. This operation requires from 2 to 5 hr. processing time from mill to evaporators, and a large volume of juice is thus in process. In the Hawaiian Islands, where mechanized harvesting by bulldozing and mechanical loading is practiced, suspended solids are added to the raw juices.

At times, where lime is used as a defecant, it takes a long time to settle the juices, and cane grinding must be slowed down. Sometimes the suspended soil is so fine grained that the mills must shut down 1 hr. out of every 3 while waiting for the mud in the cane juice to settle. And so the juice is in process for a longer time.

When the powder is used under the same difficult conditions as described above, there is immediately created an extremely fast filtering precipitate and the filtrate comes through as a live sparkling, clear light lemon colored juice in 45 min. No milling time is lost waiting for mud settling. Likewise, a minimum of solubles is introduced to the juices, since the powder is much less soluble in sugar solutions than is lime.

Eases Refiner's Problems

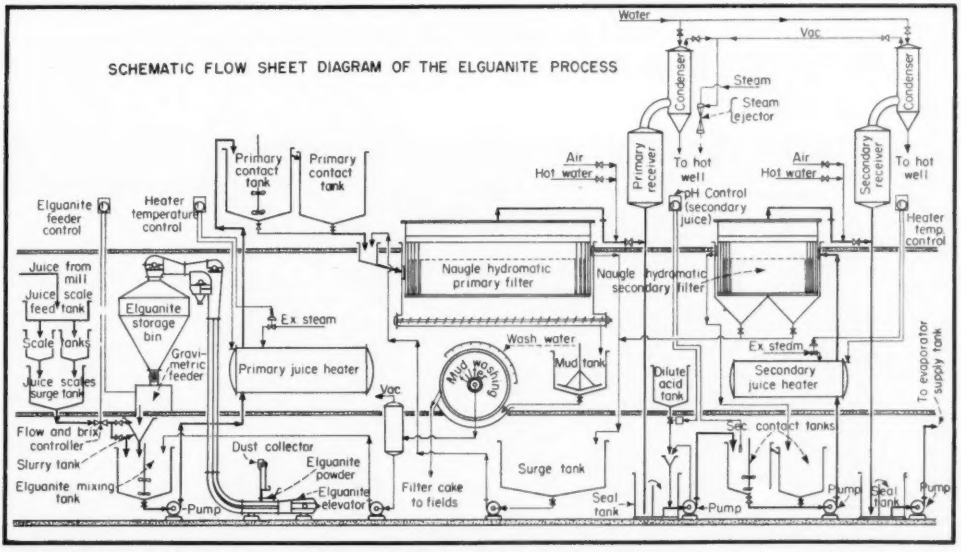
Another thing: Powder-processed raw sugar presents a substantially improved product for the refiner. The ash content is reduced, the adhered molasses film on the sugar crystal is practically eliminated, the sucrose crystal is harder, all of which creates a much simpler and less costly processing problem to the refiner. Because of the higher purity, keeping qualities are greatly improved and losses from deterioration in storage are reduced.

Notable, too, is the fact that there is less blackstrap molasses resulting from the use of the new clarifying agent in the juice. This molasses contains on an average of one-third less sucrose, which accounts for a material portion of the increased yield.

One of the most important gains brought about by the new process, as demonstrated at Koloa, is a great reduction in boiling house troubles connected with juice defecation and pan boiling.

Purity and quality of the powder processed sugar represents such an improvement that, if market conditions permit, 98.5 to 99.2 deg. raw sugar is

How New Treating System Is Set Up



OUTLINED here are the various steps in Elguanite process. Juice from crushing mill receives powder (fed proportionally), is mixed, heated and filtered. Next, pH is corrected, juice reheated, refiltered and pumped to evaporator.

obtainable and practical. This should be reflected in a reduction in shipping costs, since sugar mills would ship an extra 1 ton or more of sucrose to market for every 100 tons of product shipped. It is a matter of record that Koloa Mill's washed raw "A" strike dried powder processed sugar has shown a polarization of 99.87.

How It Works

The method of using the powder in a sugar mill is substantially different from that where lime is used as a defecant. In the first place, since the powder creates from the impurities in the raw sugar an agglomerated, flocculent particle, which acts as a fast flow filter aid, it is desirable to filter off the precipitated impurities. For this purpose there was devised the aforementioned special patented filter which is actuated by vacuum. A simple syphon effect will create sufficient vacuum to keep the filter flowing at full capacity.

As the raw mixed juice enters the new process section of the boiling house, it flows into a surge tank (see flow diagram), from where it flows by gravity to a mixing tank. The juice inlet to the mixing tank is through a venturi which proportions the pre-determined amount of powder per gallons of juice. Powder is fed into the mixing tank from a Gravimetric proportional feeder, which regulates the quantity on a continuous flow basis, usually between 2.5 to 3 percent of the soluble solids contained in the juice.

Treated juice is pumped to a juice heater, where the temperature of the juice is raised to the 79-95 deg. C. range. Then the juice is pumped to the contact tanks and from there to the primary filter. The time interval from heater to filters is approximately 10 min.

On heating, a flocculent precipitate is formed. This precipitate is readily filtered, since it does not have the gelatinous nature of the lime precipitate. Filters are operated with 1 to 15 in. of vacuum. A much larger percentage of impurities is removed from the juice when processing with powder than is removed with lime. Some low purity juices show a purity rise of 7 points. High purity juices naturally show a lower rise.

Filtered juice is clear, brilliant, and light, for 70 to 80 percent of the color has been removed.

After the raw juice has been filtered, it is heated with a small amount of phosphoric acid to reduce the pH to 7.2-7.5 range. Juice, temperature of which dropped to 70 or 75 deg. C. (158 or 167 deg. F.) during the first filtration, is reheated to a point ranging between 83 and 93 deg. C. (181 and 199 deg. F.) and pumped to a contact tank, from which it passes to the secondary filter.

Time required to pass from the heater through the filter is 8 to 10 min. A fine flocculent precipiate of insoluble phosphates is formed. And when the juice is again filtered, a further improvement in color and ash removal results. This clear juice is sent to the evaporators.

Advantages Cited

Better clarification achieved with the new method results in savings in almost every department of the factory. As stated, the juices filter rapidly and are clear and brilliant. A much greater percentage of impurities is eliminated from the juice. Organic and inorganic impurities are removed, and viscosity of the juice and products is appreciably reduced. A minimum of solubles is introduced to the juice since the powder is much less soluable than lime. From 20 to 30 percent of the ash is removed.

Full-capacity operation is possible since the operation from mills to evaporators is 30 to 45 min., because of faster separation of mud by filtration and a much smaller quantity of juice in operation. Faster operation eliminates acid inversion and prevents sucrose loss.

Muds are porous and they are filtered without the addition of bagasse and are washed to 0.1 to 0.4 percent polarization.

Reduces Scale Formation

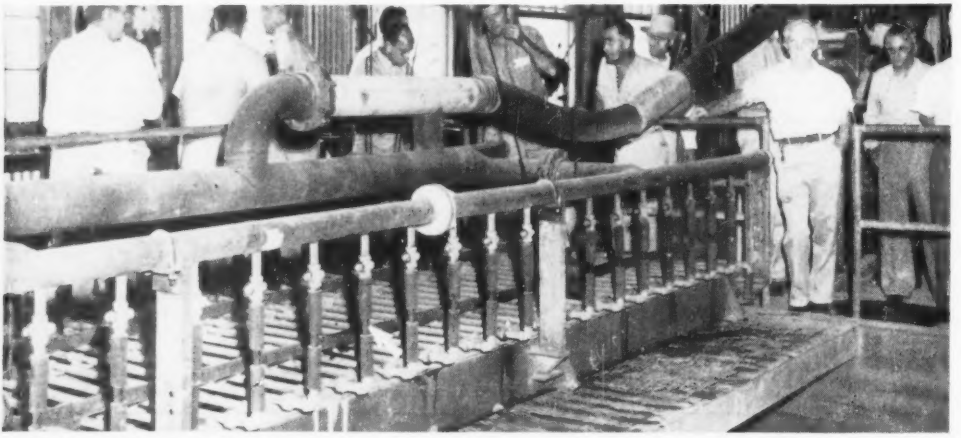
Moreover, there is less scale formation in the evaporators, and most of this scale is in the first body. The scale is soft and friable and is easily removed without use of caustic soda. There is a saving also in labor and time necessary to clean the evaporators.

Syrups going to the pan floor are light colored, clean, and of low viscosity, which makes for better pan boiling, better circulation in the pans, and quicker strikes. The massecuite are cleaner and less viscous, and better purging results.

Sugar recovery and refining characteristics are upped. And if desired, this sugar can be washed with a little water in the basket and dried to 99.8 to 99.87, which is practically white.

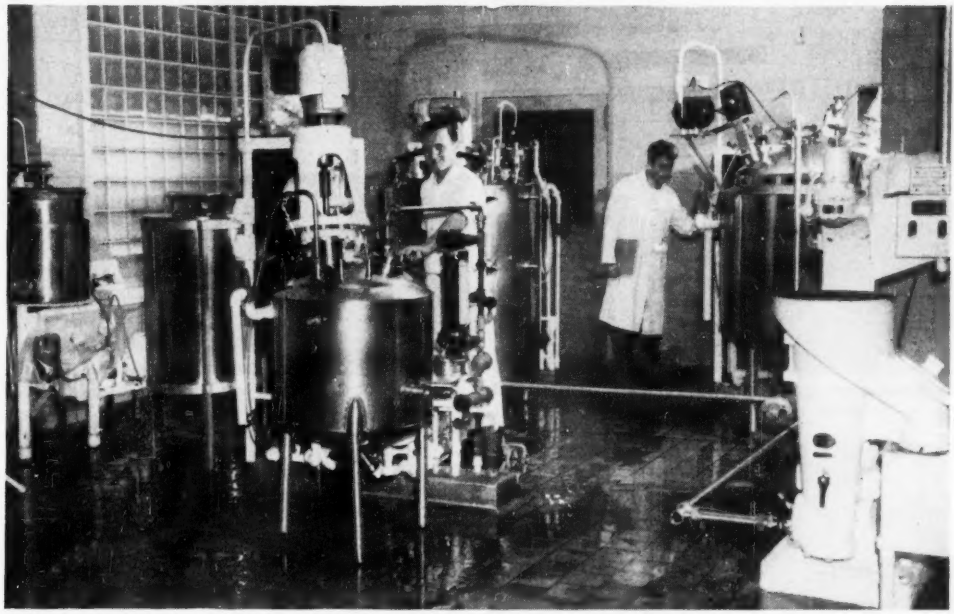
Amount of final molasses produced per ton of net cane is reduced. And the molasses contains on an average 30 percent less sucrose. Sugar recovery is, of course, increased as the sucrose content of the molasses falls.

"Down" to Work



WHEN LOWERED for operation, filter's head pipes parallel catwalk. Glass sections (arrow) permit inspection.

From research to pilot project is smooth transition



HERE, in microbiological laboratory, proximity of laboratory and pilot units facilitates the step-up from test studies to plant operations. Seen are special jacketed vats, that operate at various pressures, also small centrifuge.

Dairy Research Gets Big Boost

Wider use and better understanding of products are goals of National Dairy's new major center. Pattern it sets invites attention of all progressive food processors

ARTHUR V. GEMMILL
Assistant Editor, "Food Industries"

A significant new trend in the field of food processing is typified in the size, scope and purpose of the comprehensive new National Dairy Research Laboratories at Oakdale, Long Island, N. Y.

Here, well-directed research, in excellently equipped laboratories and pilot plants, is attacking many urgent problems of human and animal nutrition.

■ **In bringing to bear the most advanced of facilities, the new center is setting a practical example for all food processing companies, regardless of size. Hence this article, specially prepared to spotlight the details of organization and operation which form the pattern.**

The research center, one of the largest in the country, is concentrating on many projects of fundamental importance. One of these is a study of means by which the cow converts the relatively crude, low-grade feed stuffs of the farm into the excellent nutrients contained in milk. It is hoped that out of this study feeding programs can be devised that will result in lower cost of milk production.

Among other basic studies in progress at the Laboratories are investigations of the exact components of milk, the nature and identity of flavor constituents of cheese, the treatment and utilization of dairy byproducts, new methods of handling and processing dairy products, methods of preventing dairy waste, and plant sanitation.

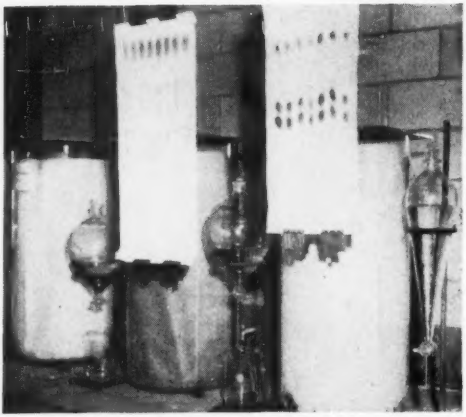
A staff of 119 scientists and technologists is already at work. These are assisted by 108 persons engaged in maintenance, office and administration, preparation and cleaning.

The laboratories are situated in the remodeled 110 room house and main out buildings of the former W. K. Vanderbilt estate. Following extensive alterations, these buildings now provided more than 85,000 sq. ft. of usable space, of

Center Now Seeks to Determine—

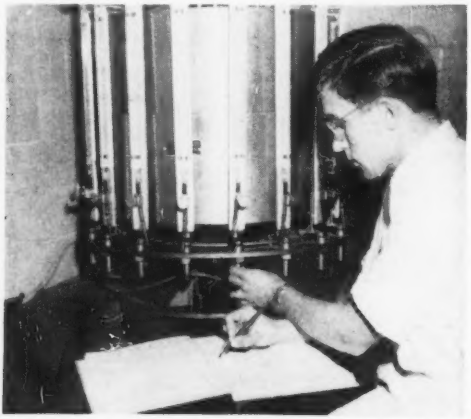
- **Exact composition of milk**
- **How cow converts low-grade feed into milk**
- **Identity of cheese flavor constituents**
- **Wider uses for skim milk, whey, and buttermilk**
- **New efficiencies in pasteurization**
- **More effective ways to prevent waste**
- **Better means of waste disposal**
- **Improved methods of sanitation**

FARINOGRAPH in baking laboratory helps evaluate quality of non-fat dry milk for breadmaking.



CHROMATOGRAPHY is used to study sugars, proteins, and amino and fatty acids in milk, butter and cheese.

WHITE RATS, seen domiciled, play roles in determining nutritional value of milk and constituents.



WARBURG APPARATUS is used in microbiological laboratory to study effect of rumen culture on lactose.

← ↑ IN THE LABORATORIES

which approximately one-half is occupied. At present there are 50 laboratories, 2 pilot plants, executive offices, a library well stocked with scientific books and technical journals, an engineering department, a cafeteria, and other facilities.

The program of the laboratories includes:

1. Basic research in human and animal nutrition.
2. Improvement in plant operation and adoption of uniform equipment and practices.
3. Research and technical services to producers of milk seeking to safeguard the health of dairy herds and promote sanitation.
4. Hygienic operation of dairy plants with the aid of biological investigations.
5. Laboratory control of plant operations.
6. Improving the standards of sanitation in plant equipment.
7. Higher efficiency in pasteurization.
8. Improvement in quality of dairy products.
9. Seeking new ways to economize on cost of operation.
10. Initiation of research to solve problems relating to the wider use of byproducts such as skim milk, whey and buttermilk.

The Oakdale Laboratories grew out of the research laboratory started by National Dairy at Baltimore in 1929. A number of the members of the present staff came from this Baltimore group, the Kraft research unit, and from other divisions of the parent company. The overall research program is under the guidance of Dr. Lauren B. Hitchcock, Director of Research & Development, National Dairy Products Corp.

How Laboratories Are Organized

There are six basic divisions of the laboratories. They are (1) Nutrition and biochemistry, (2) microbiology, (3) engineering research development, (4) dairy technology, (5) general chemistry, (6) analytical chemistry.

Nutrition and Biochemistry. This division is comprised of two sections.

A. Nutrition. This section was formed by combining the nutrition departments of the Baltimore and Kraft laboratories. Facilities consist of five air conditioned animal rooms, a feed preparation room, a large cooler and storage space. Approximately 750 experimental animals are housed

here. (See accompanying photo). A staff of three technicians and six assistants is maintained.

Study is directed toward a more complete understanding of the identity of milk constituents and the role of each in human and animal physiological processes.

B. Biochemistry. This section is broken down into four parts.

a. Proteins and peptides. These are being studied because of their fundamental importance to nutrition and dairy technology.

b. Ion exchange and enzyme section. This consists of three laboratories and one pilot plant. One of the laboratories contains ion exchange columns of varying diameters up to 4-in. and heights up to 5-ft. A stock of all commercially manufactured ion exchange resins is maintained. Both simple and mixed bed equipment is available.

Objective of this section is to obtain a more complete understanding of the nutrition and biochemistry of the milk and other dairy products.

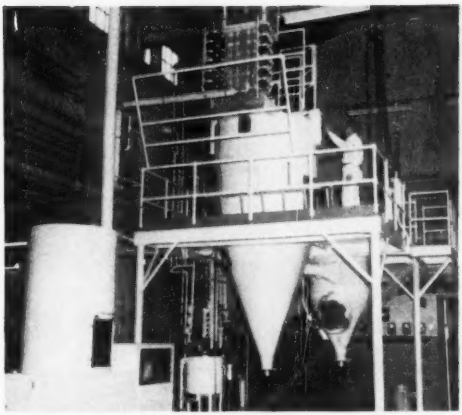
c. Chromatography. This is a method of analyzing for compounds that are difficult, or impossible, to determine by any other means. It is useful in the study of sugars, proteins, amino acids, fatty acids, and many other materials occurring in milk, butter and cheese. The purpose of this group is to develop a tool that will be applied to solving problems arising from other investigations.

d. Carbohydrates and proteins. It is the objective of this section to improve powdered dairy products such as milk and whey powders by studying the chemical and physical reactions between the proteins and carbohydrates.

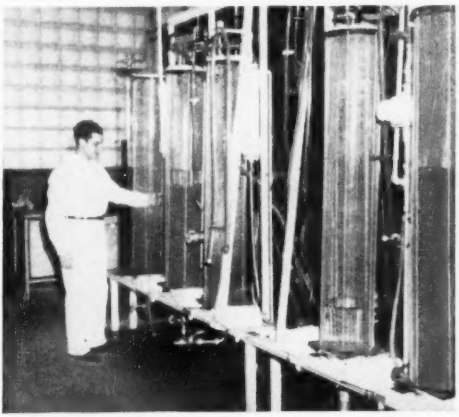
The microbiological division is made up of six sections: Rumen microbiology and physiology; microbiological assays; fermentation; microbiology of foods; general microbiology, and preparation and cleanup. Personnel of the division numbers 35.

The research objectives of this division are diversified and cover a wide range of subjects such as new uses for whey; development and evaluation of detergent-sanitizers; improvement of vitamin and amino acid assays; evaluation of high temperature short-time pasteurization treatments of ice cream mix; methods of preserving bacterial cultures; cheese ripening problems, and bacterial utilization of feed in ruminants.

An artificial rumen has been designed and constructed



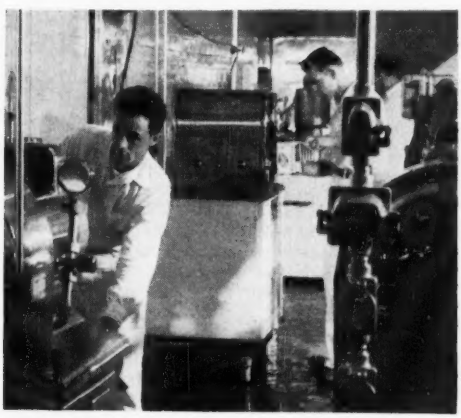
SPRAY DRYERS are run daily to improve dried products and suggest new dehydrating technics.



ION EXCHANGE columns contribute to more complete understanding of parts played by lactose and ash.

IN THE PILOT PLANTS ↓ →

BREAD DOUGHS are prepared with milk solids. Their baking qualities will be tested under various conditions.



COMMERCIAL UNITS (foreground) plant-test new frozen products first evaluated in counter freezers (rear).

which makes possible the study of the various fermentation processes taking place in the rumen. To supplement these studies two fistulated animals are maintained.

The engineering research and development division has a staff of 19, divided into four groups as follows:

A. The equipment design group which is concerned with design and evaluation of units such as vending machines, ice cream cabinets, and equipment for use in dairy plants. Pilot plant facilities are provided for testing performance of the equipment under conditions simulating those found in the field.

B. The drying technology group which investigates methods of transforming perishable liquid foods into dried materials that can be kept for extended periods of time without deterioriation. Five different types of semi-plant size drying apparatus are in daily use.

C. The packaging research group which investigates new packaging materials, package designs and methods.

D. The sanitary engineering group which helps various National Dairy plants solve their water, cleaning and waste disposal problems. This group has a light truck equipped with sampling devices, flow recorders, incubators and other special apparatus for field work.

Objectives of the dairy technology division are: (1) To study problems connected with the quality and properties of milk and dairy products for direct retail consumption, for distribution to wholesale accounts and for use in other food products; (2) to study methods of lowering production costs, improving properties and increasing keeping quality of dairy products; (3) to create new dairy products; (4) to develop methods of testing and controlling uniformity of manufactured products; (5) to appraise and utilize to best advantage flavors, fruits, nuts and sweetening agents in ice cream and other dairy products; (6) to conduct consumer preference tests on various products; (7) to assist National Dairy processing plants with special problems, and (8) to evaluate and appraise new equipment and processes.

Facilities of the dairy technology division consist of 2 laboratories and a pilot plant containing approximately 4,800 sq. ft. In the laboratories are located a miniature HTST pasteurizer, tiny cheese vats in which a quantity of milk as small as 1-qt. may be fermented, and much up-to-date test apparatus.

In the pilot plant, specially designed small-size equipment and commercial units are employed. For example, a battery of four stainless steel experimental pasteurizers of unique design, and with capacities of approximately 10 gal. each, provide facilities for processing four products simultaneously under varying conditions.

And an experimental HTST pasteurizer, equipped with numerous indicating and recording thermometers, controls and sampling devices, is used to verify results of studies carried out on the laboratory model. A graphical method of evaluating total lethal effect of pasteurizing processes is being checked by means of bacteriological test organisms.

Also in this pilot plant are two commercial continuous ice cream freezers and several small batch-type machines (see an accompanying photo). These are used in the development of new frozen desserts and flavors. Incidentally, acceptability of all newly developed products is determined by taste-testing—a procedure participated in twice daily by nearly all members of the laboratories' staff.

Additional equipment in this plant includes a number of vacuum pasteurizers, cheese vats, a vacuum drum dryer, small commercial pasteurizing vats, pumps and homogenizers.

The general chemistry division has as its objectives the up-grading of raw materials (especially byproducts) of operational divisions of the company, and the development of new products (not necessarily in the field of foods).

The analytical division is comprised of 6 sections divided as follows: (1) Inorganic; (2) protein-carbohydrate; (3) micro-organic; (4) vitamin assay, (5) a section for the development and application of new analytical methods and (6) a baking laboratory in which experimental work with bakery products is carried on. Objectives of this laboratory are: (1) To determine the effect of varying heat treatments and other processing conditions on the baking quality of milk solids; (2) to determine degree of correlation between various chemical and physical tests for baking quality and the baking quality itself, and (3) to conduct quality control work on milk powders and condensed milks manufactured by various National Dairy plants.

These laboratories are equipped with small mixers for preparing bread doughs, proofing cabinets and several baking ovens. Also included are testing equipment such as the Farinograph illustrated in an accompanying photo.

Overall objectives of the analytical division are:

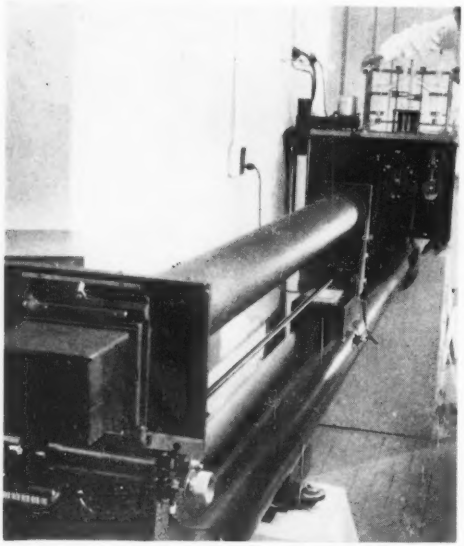
1. To provide rapid chemical analytical service for operating companies.

2. To provide analytical services for research groups at the laboratories.

3. To develop and adapt new analytical methods and instrumentation for increasing overall accuracy and sensitivity, and increasing cost.

In short, the Laboratories' organization as a whole is, in the words of National Dairy's president, L. A. Van Bomel, "Dedicated to a wider use and better understanding of dairy products."

Insistence on Best



ESPECIALLY IMPRESSIVE is the Center's insistence that the best scientific facilities obtainable be brought to bear on every problem. Attesting this policy is the installation seen here—the elaborate electrophoresis apparatus that assures new precision in the evaluation of components of milk, cheese, and other dairy products. In this equipment, a small electrical current is passed between electrodes immersed in the liquid being tested. Migration of electrically separable components of the liquid is toward the electrode of electric charge opposite to that of the particles. Application of the unit reveals the number of such components, and the mobility and isoelectric point of milk's proteins. In background, samples are being positioned by researcher.

EXCELLENT JOB that a practical wood-floor program will achieve is evident here. Seen is Regan Brothers' bake shop make-up room floor—still A-1 a year after treatment. It continues to respond to weekly wet mopping and machine buffing. Push broom or dry mop tidies it up daily.

Putting and Keeping Wood Floors in Shape

Their sanitation is simplified and maintenance costs cut by practical program of preparing, sealing, and coating . . . Output and employee morale are raised, too

J. B. JASSOY
Manager, Regan Brothers' Bakery,
Minneapolis, Minn.

Whether old or new, large or small, wooden floors can be put in first class condition—and maintained in that condition—if proper practices are followed.

For proof of this statement, we point to our experiences here at Regan Brothers' Bakery in Minneapolis. A penetrating, hard-finish, non-slip-surface wood floor dressing has been employed in our new successful program.

Previously, we had encountered difficulties comparable to those that have so often faced other bakers. We, too, had found that wood floor care and maintenance involved serious and expensive problems, particularly when the housekeeping included frequent buffing with steel wool or scrubbing with water containing caustic soaps or other such detergents.

In the course of about a year of experimental and spot testing, our new way of treating and maintaining wood floors showed encouraging results in respect to economy of application and maintenance, durability, and ease of cleaning.

Coating Details

Beginning in January, 1950, a continuing and rigid program of floor treatment throughout the bakery has been under way with consistently satisfactory results. Here are the details: First, to prepare a floor, prior to application of the commercial preserver (see table), we saw to it that the area was thoroughly scrubbed. Where needed, there was a preceding sanding.

Then, an initial coat of the preserver was applied to act as a penetrating type sealer. And this was then supplemented by one or more surface coats to cover the floor with a protective film—thickness as required, depending on the number of coats.

Large-scale application was first made in areas subjected daily to hard use, such as the bake-shop floors, the cooler exit, and machine areas in the wrapping room. These locations were selected because they receive heavy foot traffic and are continuously burdened by the travel of pan trucks and pan racks running on 2-in.-wide steel casters and carrying loads of several hundred pounds.

Within a month, there was conclusive evidence of an improvement from a maintenance and a sanitation viewpoint. These treated floors were easier to keep clean and showed higher resistance to conditions conducive to insect infestation and growth of microorganisms.

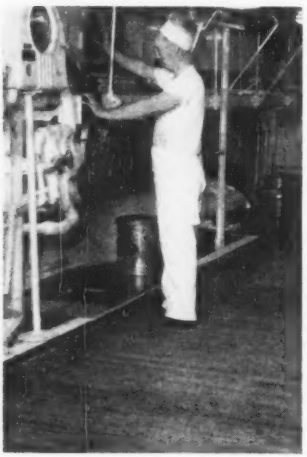
Those early results encouraged extension of the treatment to the remainder of the bake-shop floor, to the entire wrapping room, and to the shipping area. Today, every wood floor throughout the plant exposed to heavy traffic has been treated and is being maintained with the penetrating type seal and surface coating.

Through this period of several months, the floors in these areas have shown exceptional resistance to both foot and caster or wheel traffic and imperviousness to the usual objectionable effects of fats, oils, sugar, water,

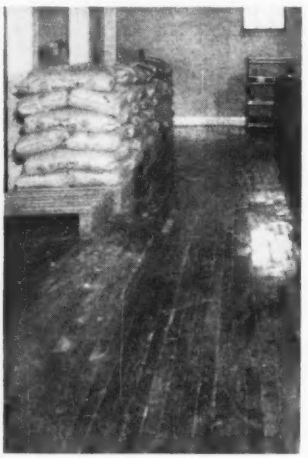
Properly Treated They'll Stand the Gaff of . . .

. . . **TRUCK CASTERS.** Despite the traffic of heavy wheel-loads, floor in the bakery's wrapping room shows no wear. It had been treated with three coats.

. . . **PALLETS.** Subjected to heavy pallet and truck loads, this floor in the flour room stays in top shape. Cleaning is now easy. Two coats were applied.



. . . **SPILLAGES.** Mixing platform floor is still in good condition after all kinds of wet and dry spillages over a seven month period. One coat did the job.



CRACK PROBLEM solved, too. Applications of preserver sealed all cracks and then smoothed this old floor in sugar storage room. It's now cleaned with a dry mop.

And You Can "Figure Your Own" From These Data

MAN-HOURS, MATERIALS, COSTS of Treating and Maintaining 1,000 Sq. Ft of Maple Flooring

Treatment				Maintenance	
Operation	Time	Material and Costs		Operation	Time
Floor preparation, scrubbing	2 hr.	Scrubbing solution,	$0.72	Daily sweep	¼ hr.
First coat application	1½ hr.	2.22 gal.* @ $4.70/gal.,	$10.43	Weekly damp mop	¾ hr.
Dry dusting floor	½ hr.	.....	.....	.....	.....
Second coat application	¾ hr.	1.54 gal.* @ $4.70/gal.,	$7.23	.....	.....

* Treating material used at Regan Brothers' was Multi-Clean Bakery Floor Preserver.

and detergents. In addition, both floor maintenance time and expense have been materially reduced. Notable, too, is the great improvement in the overall appearance of the floors.

In the meantime, the treatment has been extended to the floors in the ingredient room, sugar and flour storage rooms, miscellaneous supplies storage room, and the mixing platform. Again, in these areas, the floors have an improved appearance, are easier to clean and be kept clean, are continuously in an improved sanitary condition, and have higher anti-slip qualities. Having made walking and working easier and safer, our improved floors have resulted both in a higher employee morale and an overall increase in plant production.

Applications and maintenance are systematic. Those areas where the floors had become rough and unsightly from long, hard use were first given a thorough sanding. It was found that the last cut with the sanding machine should be made with 0 or 00 sandpaper, and thorough removal of the dust should be made with a commercial type vacuum cleaner. Floors in fairly good condition usually require only a thorough scrubbing with warm water and a floor scrubbing machine, followed by a wet-dry vacuum to remove dirt and water.

In the case of previously sealed or varnished floors, use of a varnish remover should precede the sanding and/or scrubbing. In all instances, the floors must be thoroughly dry and carefully swept with a push broom to free them of all dust and dirt.

The first coat of preserver, that acts as a sealer, is applied with a lamb's wool applicator to give a coverage of about 500 sq. ft. per gal. Thus, the pores of the wood are filled and the floor cracks and crevices are closed against dirt and microorganism and insect infestation. This sealer dries in 2 hr. Then the floor is ready for the second coat, which is applied in the same manner with a coverage of about 650 sq. ft. per gal. After a drying time of 90 min., the floor has a hard, durable, anti-slip surface and is ready for traffic.

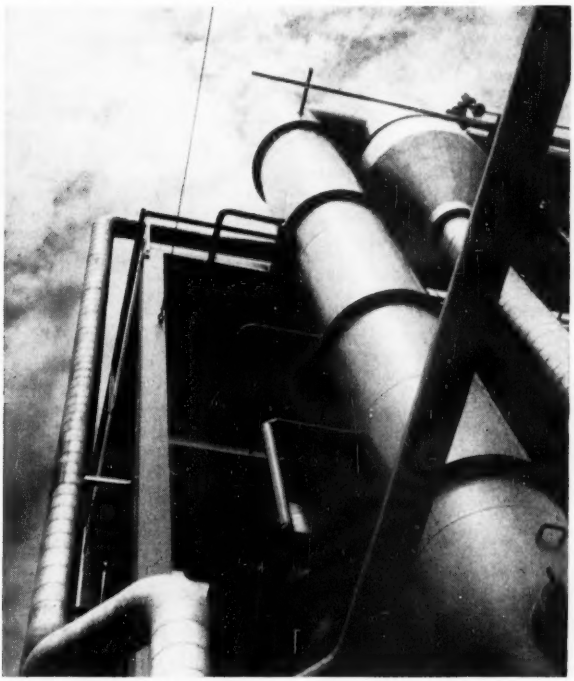
When To Use Third Coat

Application of a third coat is usually unnecessary, unless the area is subjected to extremely gruelling traffic. Conditions in our wrapping room did call for a third covering—applied two weeks after the first two coats. In that instance, the floor was cleaned by a floor machine, using a No. 2 steel wool pad to remove surface soilage and to cut the gloss and give better bondage for the third coat.

The greatest improvement was

(*Turn to page* 194)

A SPECIAL FI REPORT



Dominating plant is huge new Howard-Carrier evaporator.

Newest Citrus Juice Plant

Features Special Layout, Advanced Processing Technics

Space is provided for additional machines to meet anticipated increase in output . . . New type extractors are used . . . Frozen and unfrozen juices handled on same lines

Built, Equipped, and Working in Only 120 Days!

The most advanced concentrated juice plant in the country has just been completed by Golden Citrus Juices in the record time of four months. Enterprising management did it by—

- **Applying modern construction methods**
- **Adhering to the functional approach, thus simplifying plant layout**
- **Adapting advanced equipment from allied industries**
- **Acquiring machines that could perform dual operations**

FRED R. HOPKINS and C. K. WALKER

Project Engineer and Process Engineer, Respectively, The Fluor Corp., Ltd., Los Angeles, Calif.

Outstanding among this country's expanding juice processing facilities is the just-completed plant of Golden Citrus Juices, Inc., at Fullerton, Calif.

Most notable in this installation are its advanced, efficient engineering, new materials handling equipment and methods, new machines specially adapted to this process, and dual (automatic and manual) system of in-plant chlorination which maintains the highest degree of product and equipment sanitation. This was a new venture for

the contractor, The Fluor Corp., Ltd., Los Angeles. Heretofore, this firm had confined its activities to construction in the chemical, petroleum and power industries. It was natural, however, for Fluor to undertake the engineering of such a plant, in view of the close relationship between food processing and the chemical industry.

As the Golden Citrus plant moved swiftly and smoothly into planned production, there was quick proof of the advantages of coordinated engineering—including process, mechanical, and structural engineering—and proper selection of equipment.

■ **In just four months this $1,000,000 concentrated citrus juice plant was built and fully equipped. And within three hours from the moment the operating switches were closed, this plant was at near-capacity operation.**

Golden Citrus's program specified initial installation for a modest first-season production rate—but all flexibly planned to permit future expansion for maximum production. Throughout the plant, space was reserved for the installation of additional machines needed to give this desired maximum production. Specially fabricated equipment was flexible designed. For example, the evaporator was built in two effects, with provision for a third effect to bring the unit up to the planned production capacity.

And to the construction engineers' ability was added the technological knowledge and experience of the Golden Citrus staff, headed by General Manager J. L. Heid, who formerly directed research for the Florida Citrus Cooperative. The technicians, being interested in the production of a quality product as well as in engineering, developed specifications designed to minimize the hazard of flavor damage to the juices due to action of microorganisms.

A Big 22-In.-Long Diagram —folds out opposite p. 104 to give you a panorama of the new processing lines at Golden Citrus. Flanked with clear-cut photos of the major units in action, this FI "draftsman's special" is an extra reference for the accompanying report. We repeat—p. 104.

One example is the in-plant chlorination system, which is designed to reach every point where quality might be impaired. Their specifications eliminated pockets and dead-ends in the fabrication of Type 304 stainless steel dairy fittings, vessels, piping and evaporator. They also demanded the close-coupling of all valves at diversion points. All equipment with which the juice comes in contact is of stainless steel.

Fruit coming to the plant from the associated Eadington Fruit Co. is weighed on a continuous type scale. A representative sample is taken by a cam-operated diversion-arm, which is automatically extended at intervals into the flow of fruit on the conveyor. The main flow is routed to pre-determined bins. Capacity of this conveying system is 30 tons of citrus fruit per hour.

Fruit from packing sheds is unloaded from the side-ports of trucks and moved by a system of conveyors and elevators to the storage bins. A representative sample is automatically taken as the product is elevated to the grading table. Maximum capacity of this system is 36 tons of fruit per hour.

Steel Bins Aid Air Circulation

Storage bins are constructed of steel beams with walls of expanded sheet metal that permit circulation of air through the fruit as shown in an accompanying photo. Each of the two bins is divided into six compartments. Fruit moves on conveyors located at the top and in the center of the bins. It is diverted from the belts and rolls gently down inclined runways until the compartment is filled. These runways also provide a means of distributing the weight of the fruit to prevent crushing. Capacity of each compartment is 17½ tons, or a total of 210 tons for the two bins—equivalent to approximately 12 hours' supply for the plant.

Fruit from the bins is inspected,

Precast walls went up in a jiffy

PANELS were precast flat then erected on poured-in-place foundations. Previously cast panels served as bottom forms. Reinforcing bars tie sections together.

Evaporator was assembled "Erector" style

AS STEEL framework was erected, evaporator sections were hoisted into place, then combined to form working units. Middle effect will go up later.

HERE'S FUNCTIONAL FLOOR PLAN OF THE PLANT

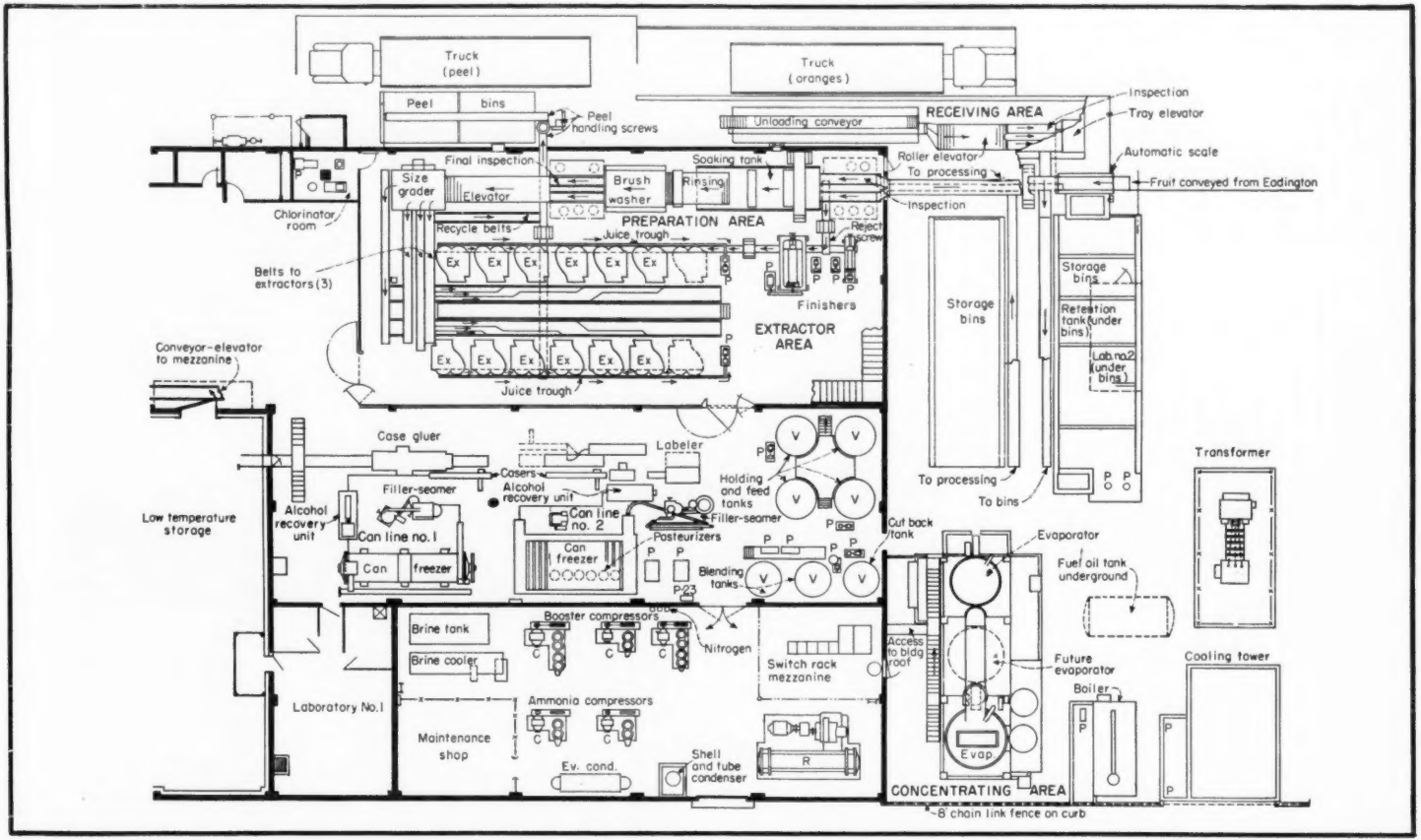
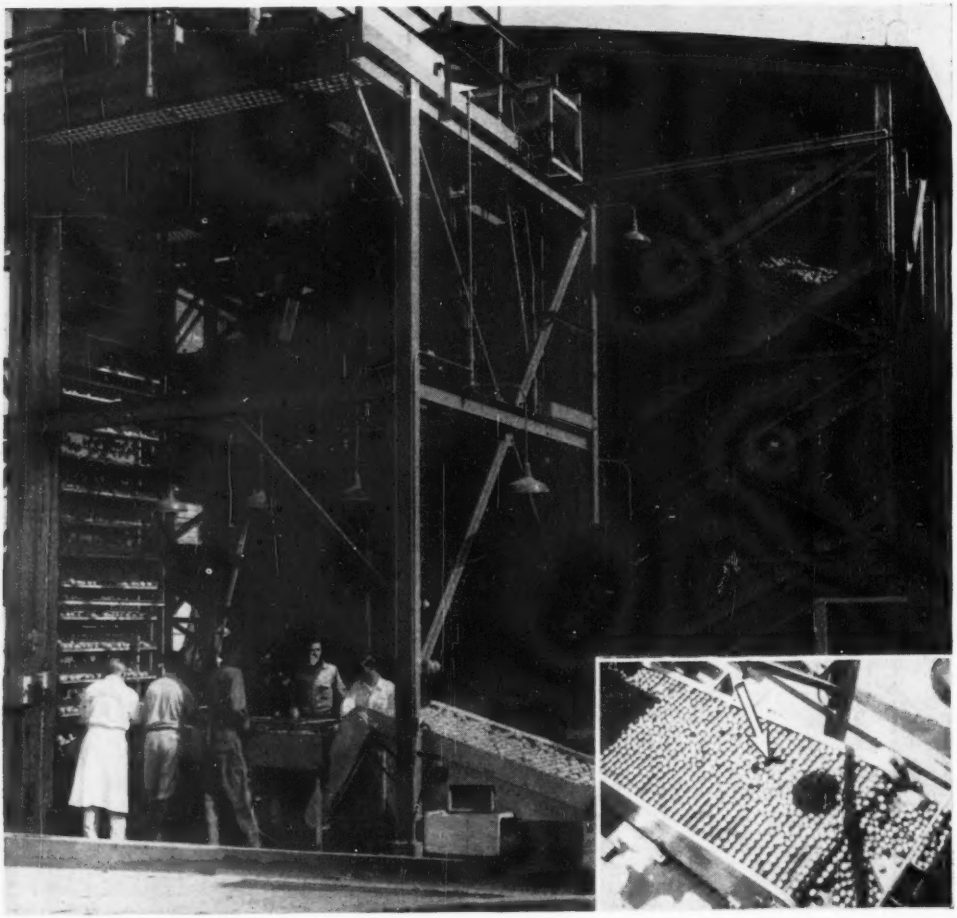


DIAGRAM shows how equipment has been located for efficient production of both frozen and pasteurized orange juice. Note that evaporator and accessories are placed outside of plant. Also, how space is provided for additional extractors and 3rd evaporator stage.



FRUIT is inspected as it moves on rollers to tray elevator that lifts it to storage bin feed conveyor. Bins are constructed of expanded sheet metal to permit air circulation. Inset photo: Cam-actuated sampler in roller elevator automatically drops out representative oranges for testing. The fruit rolls down chute into sample box.

then conveyed to a soaking tank where it is alternately floated and "dunked" by automatic paddle-like devices. This tank is filled with a detergent solution of trisodium phosphate and Triton in water containing 50 ppm. chlorine. It is equipped with steam coils to heat the solution when undesirable residues must be removed from the peel.

A roller conveyor lifts the fruit and at the same time drains the detergent solution from it, conveying it to the brush washer. Here, the oranges are scrubbed by ten consecutive rows of revolving brushes, first under sprays of detergent solution, and finally under chlorine water sprays. The fruit is given its final inspection then moves, by roller conveyor, to the size-grader and, as it is elevated, receives a final spray of chlorine water for sterilization. Rated capacity of this washing line is 30 tons per hour.

Juice Extraction

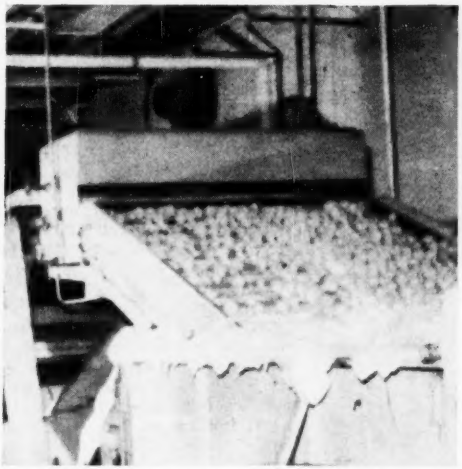
Fruit emerges from the grader classified in three different sizes. Each size is then moved to the extraction machines by separate pull-out belts. These discharge their loads at different points on the extractor feed conveyor, insuring uniform flow of proper size fruit to the machines, each adjusted to receive one of the three sizes of oranges.

Each extracting unit (Brown Citrus Machine) handles up to 3 tons of fruit per hour at recoveries as high as 130 gal. per ton. Tonnages handled and juice recovered depend upon size and condition of fruit.

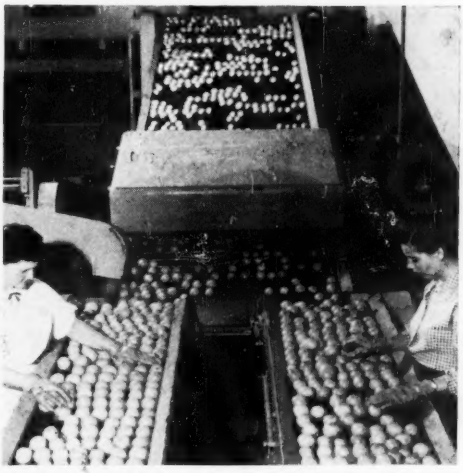
As fruit is fed into the hopper of an extractor it is picked up by cups attached to a conveyor chain and moved under the stationary knife (as seen in an accompanying photo), where it is halved. Then, as the cups pass over the forward sprocket, the fruit halves are discharged into a rotating synchronizing device that carries them to the reaming heads and feeds one into each rubber cup. The cups are closed around the orange halves by a cam action. As the cups move with the turning head, reamers enter from below and remove the juice from the fruit.

Each reamer rotates upon its own

Fruit gets thorough cleaning . . . **. . . careful inspection**



ORANGES are "dunked" in detergent solution, then drained on roller elevators, and finally brush-washed under chlorine water sprays.



NEXT COMES final inspection. Then fruit is elevated to grader, separated into three sizes, and conveyed to carefully adjusted extractors.

shaft which, in turn, rotates with the carrying member. This member is mounted upon the machine at an angle of inclination such that the reamers are withdrawn from the rubber cups at the points of loading and of peel discharge, but penetrate into the cup pocket at the point of extraction. After reaming, the cam opens each cup so that the peel is discharged and the cup is available for another orange half on the next revolution of the head. Juice flows into a trough and peel drops into the gathering screw conveyor.

Fruit rejected by any of the extractors automatically falls on a recycle belt and is returned to a roller conveyor, where it receives another chlorine spray and joins the fruit moving to the size-grader. Rated capacity of this system is 17.1 tons per hour of oranges for the 12 presently installed extractors; 20 tons for the planned completed installation of 14 units.

Peel Handling System

From the extractors, peel and pulp are discharged into gathering screw conveyors. Rejected oranges from the three inspection stations are discharged into reject screw conveyors. Pulp and seeds from the finishers drop into a gathering screw conveyor. All of these unload into a larger screw that feeds a screw elevator, which in turn feeds a screw conveyor that discharges into the peel bins. This waste is dumped by gravity through steel chutes into trucks. Capacity of the reject screws is 2 tons per hour; that of the peel screws is 12 tons per hour. Total capacity of the peel storage bins is 50 tons, equivalent to approximately four hours' running time.

Sweetening, Finishing, Holding

Juice from the extractors is discharged into a covered stainless steel trough and flows to pumps which feed the coarse finisher. This unit consists of a revolving helical screw, operating at a close tolerance within a cylindrical stainless steel screen through which the juice is filtered. Fragments of interlocular membrane and seeds are expelled by the screw at the exit end.

Finished juice is pumped to one of the three blending and sweetening tanks. Each of these tanks is equipped with an agitator for mixing purposes and is cooled by circulating a refrigerating medium in the jacket. Here, sugar is added when desired. Multiple tanks permit frequent cleaning.

The quantity of sugar is calculated from tests made on the fruit. It is added to either of the three tanks from a swing spout. The exact amount is regulated by a vibrator-timer. Juice is then cooled, pumped to the fine finisher which removes all particles larger than 0.027 in., and then goes to the evaporator. The fine finisher operates on a principle similar to the coarse finisher.

Low Temperature Evaporator

The initial installation provides for double-effect evaporation. However, space was left between these two effects for addition of another which, when installed, will become the second effect of a three-effect evaporator. The unit was constructed in this manner so that the addition will require a minimum of changes in piping and supports.

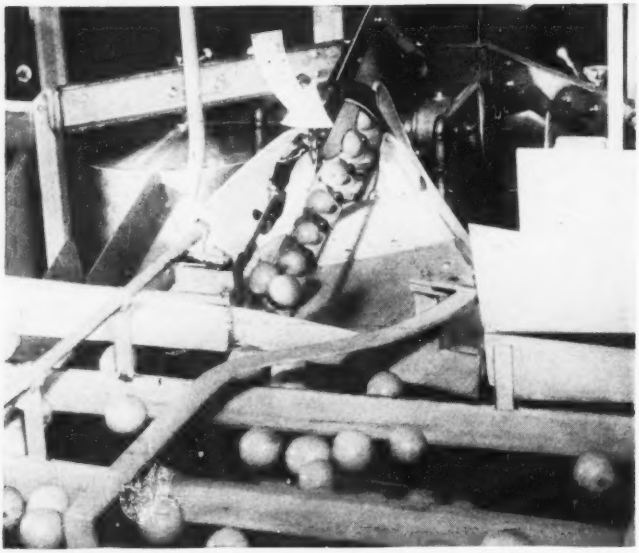
Higher Vacuum With Cold Water

Each effect of the evaporator contains 199 3-in. stainless steel tubes, 20 ft. long, or a total of 3,126 sq. ft. of heat transfer surface*. Vacuum is produced by a system of three steam ejectors and condensers that remove vapors and non-condensables from the final effect. Chilled water, at 35 to 45 deg. F., is supplied to the barometric condenser, mixing with and condensing vapors from the final effect. Use of chilled water permits operation of the barometric leg at a temperature of 40 to 50 F., making the realization of a vacuum of 29.6 in. Hg possible. Water at 102 F. is circulated from the refrigerant condenser to supply heat of evaporation to the first effect.

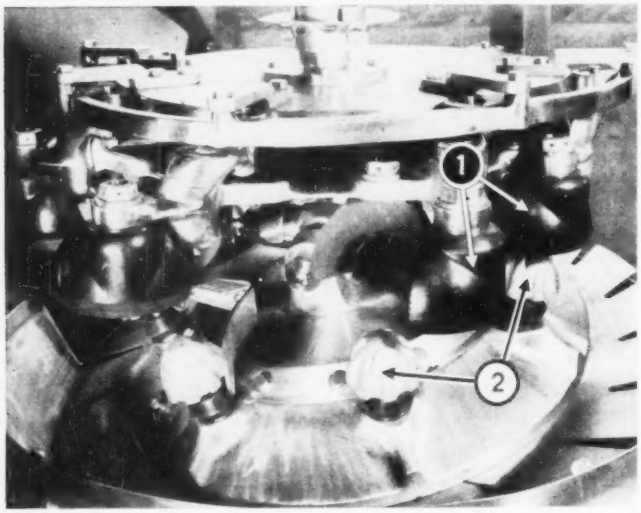
Water is cooled to 40 F. by the refrigerant from the centrifugal compressor, then it is circulated through the barometric condenser and barometric leg, and later is recirculated through the compressor by a pump taking suction from the cold well. Warm water, used for heat in the first effect, is reheated in the compression unit, and completes the cycle by circulating through the No. 1 effect back

* "New Low-Temp Evaporator Doubles Plant Production," 1386-89, Oct. '49 FI.

How New Juice Extractor Works



AS ORANGES MOVE (foreground) from belt conveyor into hopper of extractor, they are picked up by cups, moved under stationary knife (arrow) and cut into halves. Discharged into rotating device, halves are moved to reamer.



IN REAMER HEAD, rubber cups (1) grasp orange halves. Then, as they move with the turning head, reamers (2) rise and remove juice. As reamer retracts, a cam opens the rubber cup causing peel to fall into gathering screw.

through a pump to the compression unit.

Heat balance is maintained by automatic bleeding of cooling tower water into the system and ejection of excess water into the hot well. Cooling tower water is used as a condensing medium in the inter- and after-condensers of the jet system. Water from the hot well flows by gravity into the cooling tower basin.

As mentioned above, the circulating warm water stream from the refrigerant condenser supplies heat to the No. 1 effect. Vapors generated in No. 1 effect condense in the steam chest of No. 2 effect. Vapors generated from No. 2 effect condense in the steam chest of No. 3 (of a 3-effect evaporator) or condenser of the second effect, and vapors generated from No. 3 effect condense in the barometric condenser.

Juice flows in "backward feed." Fresh 12 deg. Brix juice enters No. 3 effect where it is concentrated to about 27 Brix; then it passes to No. 1 effect. It is discharged from here at the desired 58 Brix.

In the completed 3-effect evaporator, juice will be concentrated to only 16 Brix in No. 3 effect, then to 27 Brix in No. 2, and finally to 58 Brix in No. 1 effect.

The evaporator is of falling film type. Juice is pumped to the top of each unit and allowed to fall freely through the inside of the tubes into the juice pot. A centrifugal entrainment separator eases the separation of liquid from vapor. Juice is recirculated through each effect at about 600 gpm.

All surfaces of the evaporator in contact with the juice are stainless steel. Design capacity of the two-effect evaporator is 7,000 lb. per hour; of the three-effect unit 10,000 lb.

Blending the Juices

Concentrated 58 Brix juice is pumped from the evaporator to the continuous blender, where it is combined with chilled fresh juice to produce a 42 Brix product. This blender automatically controls the amount of cut-back juice to be mixed with the concentrate. The blend is then collected and chilled in tanks equipped with scraper-blade type agitators that keep the walls clean as well as mix the entire tank's contents. Juice enters through a revolving feed trough that distributes it on the refrigerated walls of the tanks. Refrigerant, circulating in the tank jacket, reduces the product's temperature to 20-25 F.

Canning and Freezing

The two canning lines will handle nine different sizes of cans. No. 1 Line is planned to fill products in the following can sizes: 202 x 212, 202 x 214, 202 x 306, 202 x 308 and 202 x 314; No. 2 Line in these sizes: 307 x 409, 401 x 411, 404 x 414, and 404 x 700.

Empty cans and bagged sugar are conveyed to the mezzanine on an inclined elevator belt. Cans are manually loaded onto an unscrambler and, as they move to the process, are sterilized by jets of steam and chlorinated water.

Both freezers operate by the principle of progressing cans counter-currently through a circulating refrigerating medium. In one of the freezers, cans are positioned on the periphery of

a drum revolving within a clyindrical shell that rolls them as they move through the refrigerant lengthwise. Cans enter this unit in a uniform procession from the seamer.

In the other freezer, cans progress from one roller to another, with the refrigerant level kept near the center of the cans. The line feeding this freezer gathers a sufficient number of cans to fill the entire length of the interstice between the first two rollers, then moves this lot into the freezer.

Dual Conveyors Separate Cans

Cans of frozen product are discharged in identical lots and, in order to space them so they can be handled by the following units, they move onto two conveyor belts arranged in sequence, the first of which moves at a rate of speed about one-half that of the second.

Thus, as the solid, unbroken line of cans on the slow belt reaches the faster moving one, they are pulled approximately 4 in. apart. Both freezers rotate the cans as they move through the units, agitating the juice and obtaining a high rate of heat transfer.

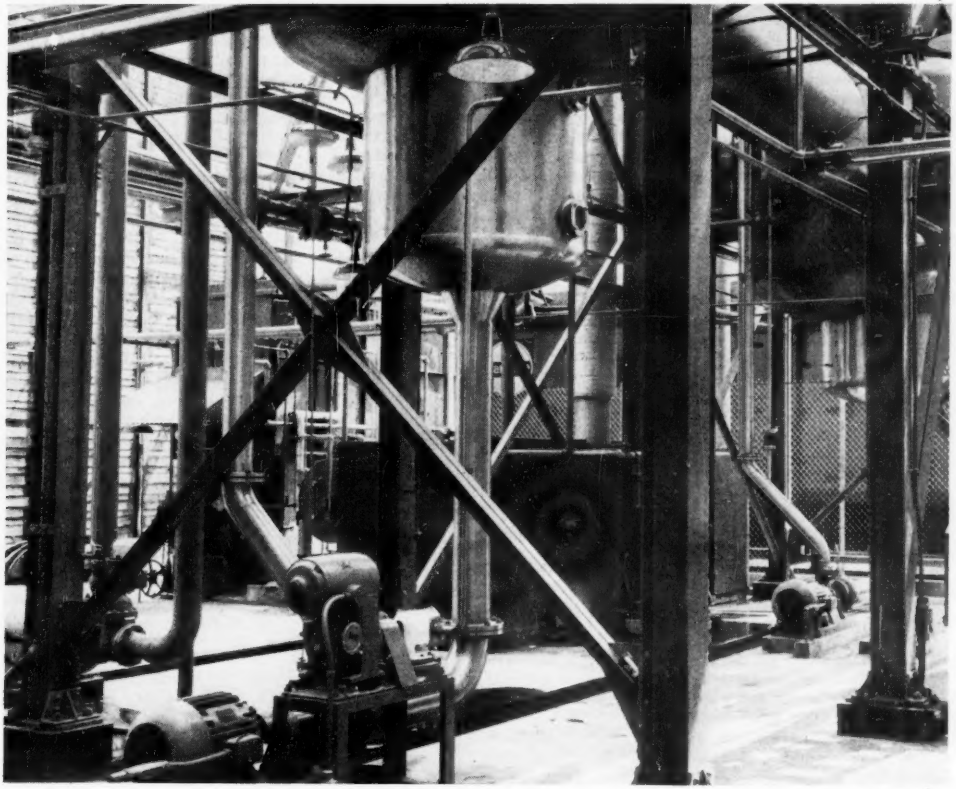
In addition to the primary purpose of freezing juice, these units are used as coolers for the canned single-strength and pasteurized concentrated orange juices. The single strength product is cooled with 80 F. cooling tower water, and the pasteurized concentrate with 50 F. chilled water from the centrifugal compressor.

From the freezers, cans move to the brush-cleaner and dryer. Cans enter this unit in an upright position on two strands of roller chain. Each flight picks up a can, places it in an endwise position on two parallel guide bars, and impels it forward into a depression between a cylindrical brush and rubber roller. The roller revolves the can and holds it against the brush, which is rotating at a greater speed. Alcohol removed from the cans is caught in a pan underneath the brush and flows into a recovery sump below the machine. Capacity of this machine, which varies with the size of cans moving through it, is as high as 350 per minute.

Some Juice Is Pasteurized

The principle requirements for pasteurization of single strength and concentrated orange juice were to attain a product temperature of 210 F. and cool to 190 F. in not more than 10 sec. The units selected are not widely used in the food industry, nevertheless they more than meet these requirements. Each unit consists of two coils of ¼-in. O. D. stainless steel tubing, 25 ft. long, with a total heat transfer surface in each unit of 3.3 sq. ft. There are twelve of these units arranged in two banks of six each, one above the other. The lower bank serves as pasteurizers and the upper as coolers. All twelve are used in the pasteurization of single strength juice. Only two units, a pasteurizer and a cooler, are

Evaporator Has Expandable Capacity



LOW-TEMP evaporator comprises two effects, plus space for later addition of another. Photo shows (top foreground) centrifugal vapor separator of final effect with juice pot directly below. Juice is recirculated through large pipes by means of pump on floor. Second pump (on stand) removes concentrate to holding tanks in plant.

needed for pasteurizing orange concentrate.

Juice intended for pasteurization is collected in tanks and is pumped to the pasteurizer feed pumps. These dairy homogenizer-type pumps discharge juice into the pasteurizers at 600 psi. It passes through the heating and cooling units, then goes into the filling machine.

These pasteurizers depend upon high velocities through the tubes—at least 20 ft. per sec.—for efficiency and cleanliness. Lower velocities may result in overheating the product. Pressure drop through the system is correspondingly high—500 to 600 psi. Juice is pasteurized and cooled in approximately 2 sec. elapsed time.

A combination temperature recorder-controller and diversion valve regulates the temperature for pasteurization and diverts juice back to the blending tanks if for any reason this temperature is not reached.

Refrigeration

This system uses ammonia as the evaporative refrigerant. Refrigeration from this source is used at two points in the plant: (1) In the storage room to maintain a —10 F. temperature, and (2) in the shell and tube exchanger to cool the secondary refrigerant used in the two freezers and cold-wall tanks. The two-stage compression system develops 90 tons of refrigeration.

Direct process refrigeration is produced by circulating the cold medium through the jackets of cold-wall juice storage tanks and through can freezers. Refrigerant circulation to each one of the cold-wall tanks is regulated by an automatic temperature controller. The refrigerant is pumped from the brine surge tank through the brine cooler to process equipment. In the cold-wall tanks, it flows upward through the jackets and back through a closed system to the surge tank. It overflows from the freezers into a header and moves by gravity to a pump.

Plant Utilities

A further advantage of coordinated engineering and technology is seen in this citrus plant's utilities. As an example, all process water is treated to insure its sterility.

Because the application of heat to citrus juice modifies its flavor characteristics, concentrated frozen juice is not heat-sterilized. Every precaution is therefore taken to prevent microorganisms from damaging the quality of the final product. The in-plant chlorination system reaches every point where possible hazard to the product may exist. It is serviced by one automatic machine that furnishes 50 ppm. chlorine to 200 gpm. water, and is capable of chlorinating up to 650 gpm.

In addition, there is a manual machine that furnishes 10 ppm. chlorine to water for general plant use with a capacity of 125 gpm. The 50 ppm. chlorine water system is piped to: Sprays over fruit on washing lines; the soaking tank for make-up water; automatic rinse for each juice extractor; spray-heads for undersides of conveyor belts; hose connections; and the high-pressure cleaning pump. The 10 ppm. solution is piped to: The brush washer for make-up water; can sprays on lines; the evaporator; and hose connections.

City Sewage System Used

Waste water is collected in floor drains and gutters, and it flows by gravity into a 15,000-gal. waste-retention reservoir located below ground level underneath the fruit storage bins. The water is then screened and finally pumped into the city sewage system.

Instantaneous waste water rates from the plant vary throughout the day. The retention reservoir and pumps are designed for discharge into the city system at fairly constant rates, thus reducing the hazard of objectionable surges. Pumps are capable of moving double or more the average sewage water rate so a high volume of waste water may be discharged when the load is light. The discharge is reduced to below average when city sewage is at peak load.

Floors of the plant, which slope ⅛ in. per ft. to gutters, and the wall bases, are of red quarry tile, an aid to plant sanitation. There are three general clean-ups each day; the sides of all machines are removed and the unit washed with a high-pressure (500 psi.) cleaning gun. Headers for the cleaning hose are located throughout the plant.

The pasteurizers, which are normally scoured by the velocity of the stream moving through the tubes, are also cleaned with alkaline detergents, and sterilized with chlorinated water pumped at high pressure.

Cooling Tower Water System

Water from the cooling tower is pumped to the evaporator, the evaporative condenser, the water booster pump (for use as a cooling medium in the pasteurizer cooling units), the can freezers (for use as a cooling medium in the manufacture of single strength juice), and to the office air-conditioning unit. It is discharged from these various services into a 10-in. pipe and flows by gravity to the hot well section of the cooling tower basin, from which it is pumped over the cooling tower and is recirculated through the system.

Canned pasteurized orange concentrate is cooled to about 50 F. in the freezer by circulating 10 gpm. of 40 F. water through the unit. This water is obtained from the centrifugal refrigeration compressor, which circulates a stream of chilled water through the barometric condenser system of the evaporator and back to the compressor at rates of about 930 gpm.

Steam

The automatic steam boiler is rated to produce 3,500 lb. of steam per hour at 125 psi. It is used for the barometric condensers which require 660 lb. per hour when starting and 330 lb. per hour under normal operation. The pasteurizer requires 2,900 lb. per hour when producing single strength juice and 370 lb. per hour for pasteurized concentrate. Steam is also used by the can sterilizers, seamers, the can-heating unit just before the labeler, at hose connections, and for building heaters.

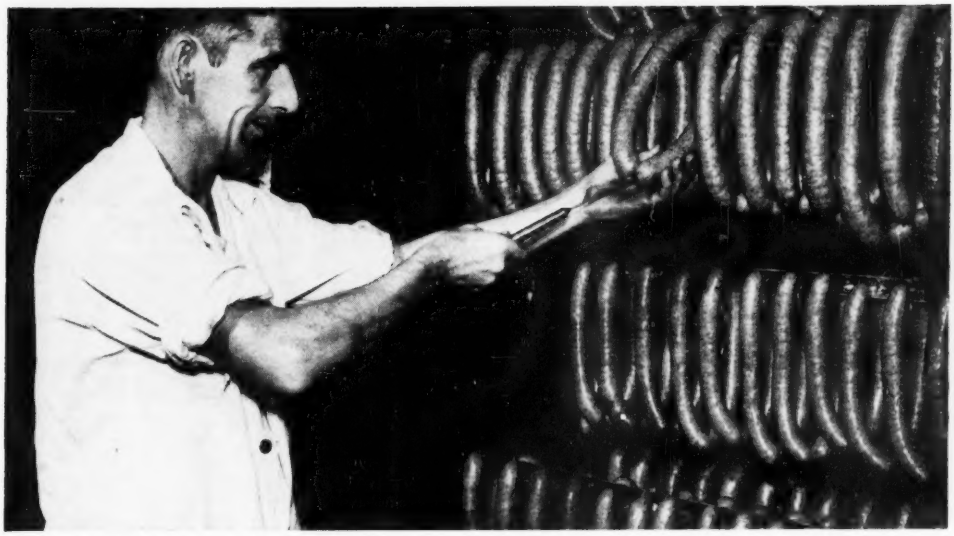
Electricity

Capacitors are used in connection with the large compressor motor to improve the power factor to 95 percent of unity, resulting in lower power costs. The connected load of electricity is 950 hp., with a demand factor of 0.85.

Quality Control

Before the fruit reaches the plant, quality control begins, and it ends only after the product has been sold and consumed. After arrival at the processing plant, automatically selected representative samples are tested for juice yield, composition, and flavor characteristics. Payment for fruit, and blending of fruit from various bins, are based on these tests. Chemical and microbiological checks are made daily or at more frequent intervals throughout the operation. Routine sanitary inspections are made throughout each stage in the processing. A final check is made just before the product is packaged.

Samples of packaged products are checked for net contents, temperature, sugar, acid, vitamin C, orange oil, quantity and quality of pulp, and the flavor, appearance, and stability of reconstituted products. Samples are set aside from each code for comparison in the event complaints should be received after consumption. Colony counts are made on Lindegren's and orange serum agar. The accumulation of this chemical and microbiological data provides a guide for improvements in plant operation and a guaranty of production with the highest possible uniformity and consumer appeal.



INTO SAUSAGE, hanging on tree in smokehouse, goes special needle-point thermocouple that plays key role in improving quality and reducing smoking time. It quickly and accurately measures internal temperature of meat.

'Couples Raise Efficiency, Slash Costs

New method of measuring internal temperature of meats reduces smoking time by 15 percent, improves products, and saves considerable fuel and labor

JACK MEYER
Food Industry Engineer,
Minneapolis-Honeywell Regulator Co., Philadelphia

With the recent adoption of standard instruments for measuring the internal temperature of meats and meat products during smoking and cooking operations, Weiland Packing Co., Phoenixville, Pa., has been able to reduce smoking time by 15 percent.

The company reports appreciable savings in labor, steam, smoke, and heat, and it has improved the quality of its products.

Basis of this efficient system is a 12-point electronic strip-chart recorder that serves as a guide to the operation of 14 smokehouses and cook-boxes.

The instrument is connected directly to ten thermocouples. It is also joined to any two of four additional sensing elements by means of selector switches. In this way, the temperature at any 12 of 14 points can be measured and recorded by one instrument.

A newly-designed thermocouple, which is pointed at the tip for easy insertion into a ham, bologna, or any other type of meat or sausage product, is the sensing element used in this improved technic. Essentially, this element consists of two wires of dissimilar metals that are welded at one point (the hot junction) and connected to an electric measuring device at the unwelded (cold junction) end. When the hot junction is exposed to a temperature change, the thermocouple produces a minute electric voltage which varies with the temperature at the junction.

Thermocouples for measuring internal temperatures in meats are enclosed in a small-diameter protecting tube with a pointed tip. An enlarged section of this tube contains the wire connections between the thermocouple and extension leadwire. The tube also serves as a handle.

Only the tip of the 'couple measures temperatures, while the rest of the element merely conducts the voltage back to the instrument. The ambient temperature in the smokehouse and the temperature of the outer sections of a ham have no effect upon the accuracy of the internal temperature measurement.

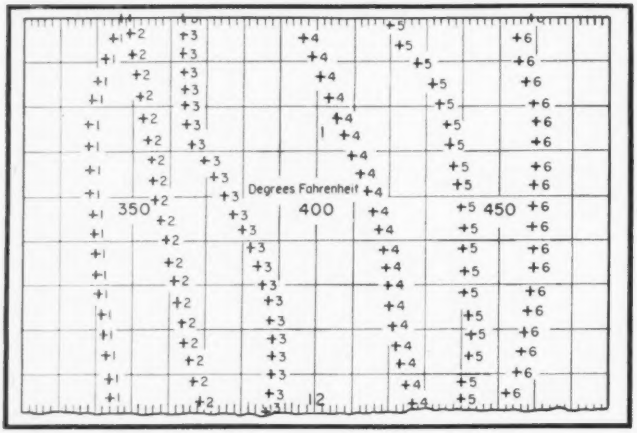
Since the thermocouple is only as thick as an ordinary knitting needle, it can be inserted into hams, bolognas, and sausages without splitting casings or scarring meats. The hole remaining after the thermocouple is removed is practically unnoticeable, hence does not affect salability of the product.

Procedure Detailed

The thermocouples, which are wired in conduit to each smokehouse, are connected to a multi-point recorder, located in a central corridor just off the sausage room. This location simplifies operations for the workers, for thus they can check on the progress of the smoking and cooking operations as they go about their other duties.

Each point of measurement is identified on the record chart by a small plus sign and a color-coded number to signify the thermocouple represented.

The procedure followed at Weiland's for measuring the internal temperatures of meats depends upon the type



STRIP-CHART shows temperature recordings from six thermocouples.

of product and the smokehouse being used. Although the plant is undergoing almost complete modernization, a number of multi-story smokehouses are still in use. Presently, the thermocouples are wired to some multi-story smokehouses, to the new Woodside smokehouse recently completed, and to some cook-boxes.

The only deviation from former smokehouse practice takes place after the meats have been hung on racks that have been pushed into the smokehouse. At this stage, the worker takes a thermocouple, mounted on a flexible rubber cable, and sticks it into the center of one of the meats. And occasionally the operator checks the chart to learn how the process is proceeding.

After the meat is finally cooked, the thermocouple and electronic instrument also speed the cooling process by showing the attendant when the meats have cooled sufficiently for further handling

Benefits of New System

Weiland has derived major benefits from the new method of measuring internal temperatures in meats. It has enabled the company to pack a superior product through exerting a better control over processing. For instance, the raw areas occasionally encountered in the center portion of undercooked sausages are entirely eliminated. Moreover, accurate control of cooking time and close regulation of temperature and relative humidity assure the packer of a more precise control of his shrinkage.

Fading and graying of sausages—other disadvantages attributed to undercooking—have been prevented. Breakage of casings and the formation of greasy products which are characteristic of overcooking have also been avoided.

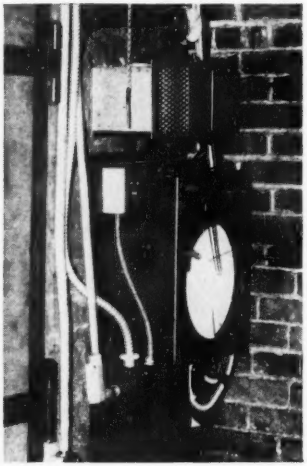
The multi-point temperature measuring system has also been of value in the experimental work that is being carried on by the packer in the new Woodside smokehouse. Complete smoking, finishing, and cooling operations are carried out in this unit in the course of developing new products and new smoking schedules. Since this smokehouse accommodates four trees, it is provided with four separate thermocouples to insure uniform results and exact control.

Air temperature and relative humidity in this house are also regulated by a recording-controlling thermometer. By comparing the record chart of the thermometer with the graph drawn by the multi-point instrument, the effects of various air temperatures on the internal temperature of meats can be determined.

Weiland feels that such continous experimentation under commercial operating conditions is of great value in improving and maintaining quality.

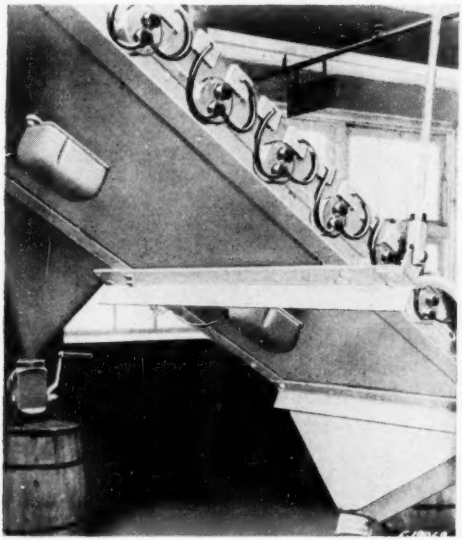
These Instruments Control and Record Smokehouse Temperatures

CONTROL instrument (on wall, right) enables packer to regulate temperature and relative humidity inside smokehouse. "Protectoglo" system shuts off fuel supply in case of flame failure, thus prevents explosions.



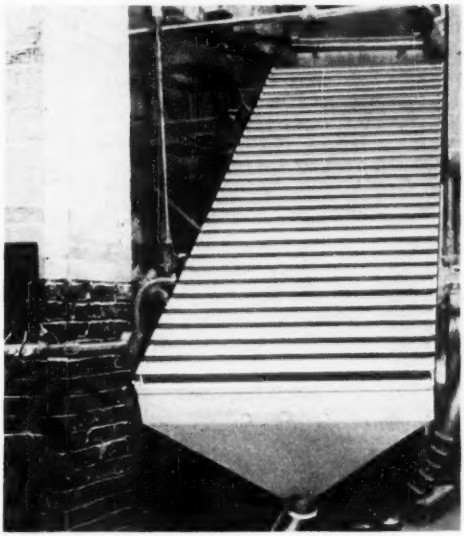
MULTI-POINT instrument, centrally located near sausage room, shows internal temperatures of meats.

Thermophile-targeting incline . . .



SIDE VIEW of portion of inclined table. Underneath, two of three vibrators are seen. Note electric wiring to lamps.

. . . Is covered by 30-lamp battery



FRONT VIEW shows 30-lamp cover. Crystals enter at top. They bounce down ray-barraged plate to outlet pipe (front).

"Ray-Table" Unit Curbs Bacteria on Sugar

To protect canners against any thermophile contamination of the crystalline product, Canadian refiner passes grains over vibrating plate bathed by germicidal lamps

A. F. BLAKE
Refinery Manager,
Atlantic Sugar Refineries, Ltd.,
St. John, N. B., Canada

Canners are assured their sugar is thermophile-free when they order from our Atlantic Sugar Refiners, Ltd., of Canada. For the refinery at St. John, N. B., has set up special equipment employing germicidal lamps to treat all sugar prior to shipment.

Granulated sugar, probably the purest food product on the market, contains about 99.95 percent sucrose, 0.02 percent water, and 0.03 percent mineral and organic impurities. Importance of sanitizing the product is recognized in todays technics.

Some years ago, investigators for the National Canners Association in the United States discovered, during an epidemic of gas formation in canned peas and corn, that the causative organisms, thermophiles, were brought in on the sugar that was added. These anaerobic organisms, which thrive at temperatures above 55 deg. C, can survive the sugar refining process. It may be noted, incidentally, that they also survive the pasteurization of milk.

Thermophiles can be brought into the canner's product by the vegetables being processed, but since it has been specifically proven that they can exist in processed sugar, the refiners felt called upon to provide this product for canners' use reasonably free of these contaminating organisms. Several methods have been proposed and used.

In one method, a batch of sugar is set aside for three or four days while the laboratory tests samples. If thermophile-free, the sugar is shipped; if not, a new batch is tried. This has obvious disadvantages.

Plate and Lamps

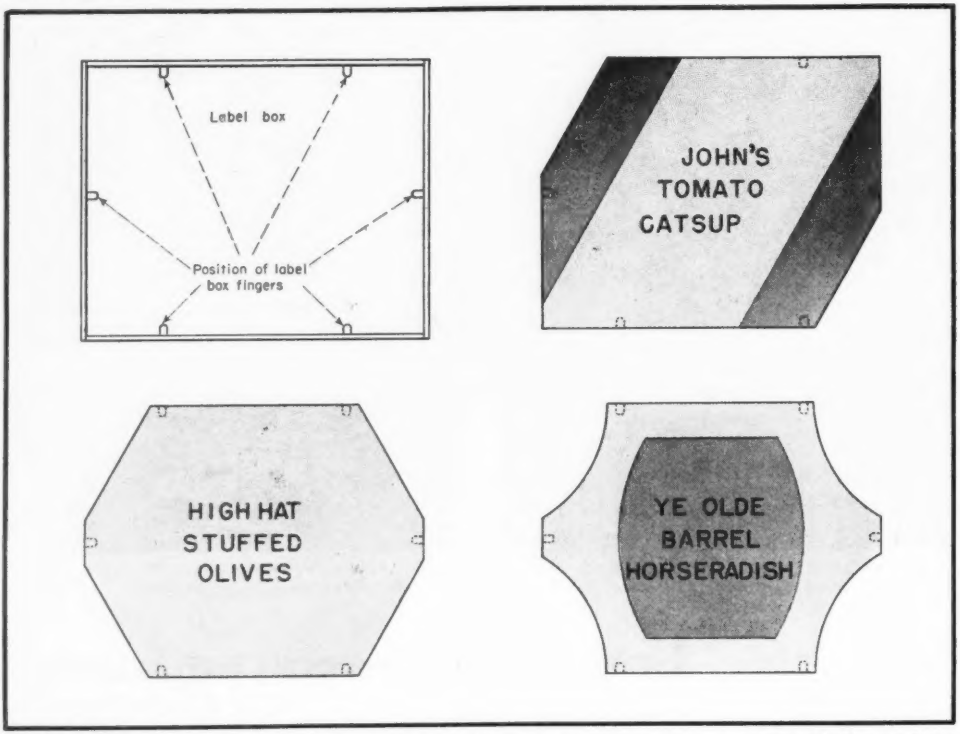
At our own refinery we use a sure-fire method of obtaining thermophile-free sugar for customers requiring it. Here, we employ equipment designed to expose every facet of the sugar crystal to germicidal ultraviolet energy.

Designed by George W. Gates & Co. of New York and given the trade name "Raymaster," this equipment consists of a stainless steel plate, about 12 ft. long and 3 ft. wide, set at an angle of about 25 deg. from the horizontal and vibrated by three Syntron units. A vibrating feeder controls and distributes the granulated sugar evenly across the upper end of the plate. Sugar bounces down the incline in a thin layer and is collected in a hopper at the lower end for packing in multiply paper bags designed to prevent re-infection.

Set over the stainless steel plate, on 4½ in. centers, 30 Type-G30T8 General Electric germicidal tubes irradiate the sugar during the entire course of its traverse down the inclined table. On this size machine, about 2,500 lb. per hr. of granulated sugar can be completely sterilized or at least made to conform to the National Canners Association specifications.

The use of stainless steel for the plate of the conveyor, and Alzak aluminum reflectors behind the germicidal tubes increases the effectiveness of the radiation.

There Are Countless Possibilities Without Changing Fingers



SHAPES of labels are readily varied without costly alterations of box fingers on bottle and jar labeling machines.

LABEL REDESIGN: Don't Ignore the *Labeler*

With an eye to the mechanical aspects, you can achieve new designs with the fewest "switches." This cost-saving article tells how

E. KING GRAVES
Sales Manager, Edward Ermold Co., New York City

In projecting the redesign of a label, it might seem natural to immediately concentrate upon the specific changes visualized—the illustration, color, and typography factors.

But if logical economies are to be exercised, one other highly important factor had better be given attention at the very outset. We refer to the *mechanics* of the problem.

In short, there should be prior range-finding aiming toward a design that can be held within, or close to, the limits of existing machines and attachments.

These limits should be clearly understood by those in the sales and advertising departments who are shaping the new conception. We hasten to say that this approach need not hamper the designer. In almost every case, he can create an eye-catching label—within the limits—that will be highly effective sales-wise, yet involve only a minimum of expense.

Daily, our own company receives orders for attachments for labelers to accommodate new labels. Generally, these new labels only involve changes in the color scheme and printing motif. If, however, both size and shape are changed, it may be necessary to buy new attachments for machines.

Three alternatives are open to the bottle goods processor who has decided on a change:

1. Redesign the label so that labeling machine changes are unnecessary.
2. Keep label changes within limits which require only minor alterations and a minimum of new parts.
3. Make labeling machine changes to provide for completely new labels.

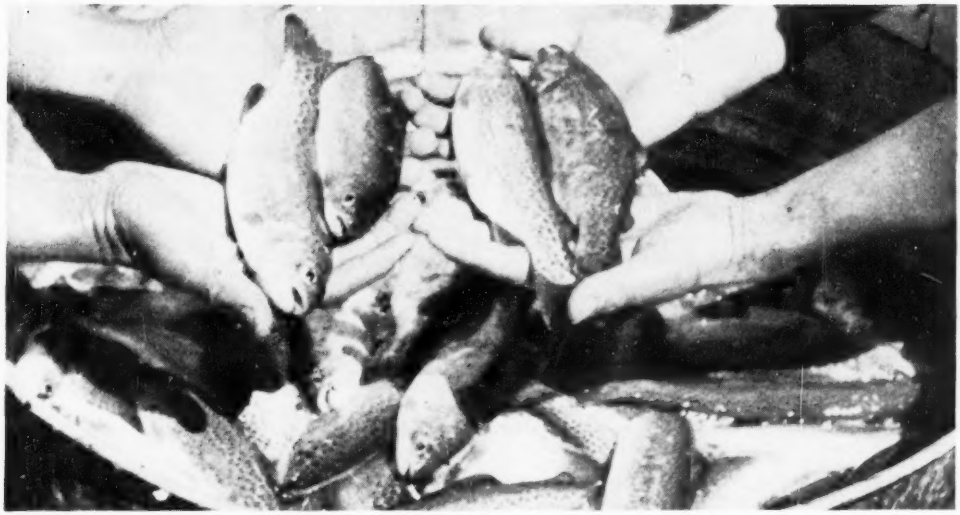
Of these three points, the first two deserve real study.

Examine the label boxes on your production lines. Measure the boxes, then make a drawing showing actual size of labels now handled, and accurately note the location and size of the hooks and guides that hold the stack of labels in position.

The first drawing accompanying this article illustrates the label box and the location of six box fingers, or

(*Turn to page* 188)

PICKED FOR PACKING: Get out your frying pans, carriage trade!



JUST TAKEN from pond, these select size-graded fish will go directly to adjacent plant where they will be processed immediately. Having had painstaking care from egg stage on, they're of top table quality.

How They Process Quick-Frozen Trout

Tempting Rainbows plus advanced technics make this West Coast quality-plus product. Freshness is assured by high speed of pond-to-package operation

C. R. HAVIGHORST
Associate Editor, "Food Industries"

Within 20 minutes from the time they are taken from the growing-ponds Rainbow trout are eviscerated, packaged and quick-frozen at the Xman Trout Ranch, Reno, Nev.

These quick-frozen trout have created a carriage-trade demand that exceeds the supply. Formerly, Rainbow trout raised for commercial use have been available fresh, iced, or frozen in blocks, but these are quick-frozen in 1-lb. retail and 5-lb. institutional packages.

Except for shipping in of trout eggs and fish food, Xman's is practically a self-contained, food producing and processing operation with an annual capacity of 400,000 lb. of finished product. It represents a capital investment of more than half a million dollars.

The 29-acre ranch has 36 trout growing-ponds, each 20 ft. wide, 125 ft. long, and 3½ ft. deep, located 12 to a terrace. These ponds and 2 main reservoirs that are 75 ft. wide, 200 ft. long, and 13 ft. deep, are all supplied with fresh well-water at about 58 deg. F., pumped from a 325-ft. deep well.

Incoming water is aerated by throwing it high in the air from 6-in. header pipes. Another system of pipes, with spray outlets, is suspended over the ponds to provide additional aeration when needed.

Plant Facilities

Inside the plant are an evisceration room, the weighing and packaging department, and a low-temperature freezer room in which the packaged trout are quick frozen at —40 deg. F. One part of the plant is devoted to incubator troughs where a new method for incubating trout eggs is used.

A series of rearing-ponds just outside the plant is supplemented by 12 larger ponds located at Sparks, Nev., two miles from Reno. Rearing-ponds vary in size. Those in Sparks are 6 ft. wide, 2 ft. deep, and 60 ft. long, and they utilize about 30 gpm. of water. Those at the plant, being smaller in size, use about 15 gpm. of water. This variation in fresh water use arises from the dissolved oxygen demand of the fish in these ponds.

Incoming fresh well water is piped to the 12 growing-ponds on the upper terrace. Water flows by gravity through revolving weirs (located in concrete outlets of each pond) into ponds on the two lower terraces, finally into the main reservoirs. Paddle wheels within each weir, operated by the water drop, revolve the weirs counter to the motion of the paddle wheels.

Discourage Trout's Taste for Trout

Moss, algae, and other unwanted materials hazardous to fish life float with the current, are picked up by the weirs, and dropped into each succeeding pond. Debris finally reaches the main flume and is routed to the irrigation ditch. The paddle wheels further aerate the water and the weirs effectively prevent fish escaping from ponds. Usually, the fish in one pond differ in age and size from those in the connected pond. Sizes must be kept separate, since the larger fish would eat the smaller ones.

FARMING →

INCUBATION. Eggs, flown in to plant, are immediately placed in trays and immersed in these troughs of water.

PROTECTION. Fingerlings go to these rearing ponds, seen here being surface-sprayed to kill algae, fungi, bacteria.

The year-long growing process begins in the incubation room when "green eggs"—so-called because of their early stage of development and not because of color—are hatched. Trout eggs are highly perishable and fragile, so are shipped to the ranch by air in cases specially constructed to protect them.

Each case contains about 200,000 eggs, carefully placed on small screen-bottomed trays and covered with cheese cloth. The case has false walls, top, and bottom. This space is filled with ice to maintain a temperature of 34 deg. F. within the case. Provision is made for water from the melting ice to drip through the top and filter through the trays of eggs, keeping them moist. Received at the plant, eggs are immediately placed in incubation trays and immersed in troughs of water.

Four trays, each containing about 15,000 eggs, are placed in racks in these troughs, through which an 8-gph. flow of fresh well water at a temperature of 48-52 deg. F. is constantly maintained.

The incubation trays are so constructed that the gentle flow of water is diverted upward, through the screen bottoms, so that the eggs remain in an even layer and do not drift into piles.

Fry to Fingerlings to Trout

After breaking from the egg shell, the embryos, now called "fry," lie on the bottom of the trough for 15 to 20 days, feeding only on the remains of the egg sac. After the sacs are consumed, the fry rise to the surface and are then fed finely ground beef liver. A hatch of 95 percent from these eggs is considered normal.

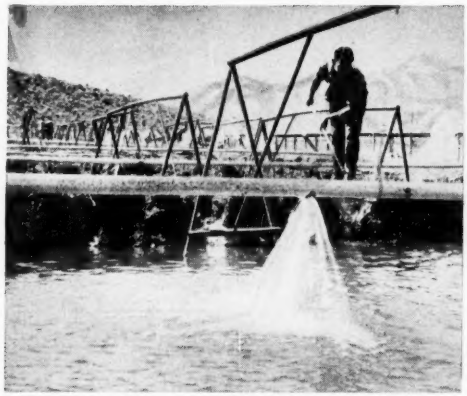
For about two weeks the tiny fry are fed once every hour. Then feedings are reduced to three times a day, later only twice a day. As soon as the fry show an ability to eat well, they are moved to outside rearing ponds. When 1 in. long they become known as "fingerlings." Not until they are 2 to 3 in. long are they moved to the larger growing-ponds. At 6 in. they are called "trout."

Life for the pampered trout in these ponds is made as safe and comfortable as possible. The number of fish stocked in each pond is determined by water temperature and the dissolved oxygen content that can be maintained in the

PROCESSING →

NETTING. Three men pull net from one end of pond to other, gathering ready-to-pack fish in this grader.

HEAT SEALING. To preserve freshness, eviscerated fish go in individual cellophane sleeves that are heat sealed.



AERATION. Mature fish grow in ponds on terraces. Water is carefully aerated by sprays (center) and headers (rear).

WEIRS. Each terrace pond is cleared of moss and algae by a weir-wheel which drops out unwanted matter.

water. Trout are healthy and grow more rapidly if water temperature is around 58-60 deg. F. and dissolved oxygen content at least 5 ppm. If the water temperature rises to 83 deg. F. or its dissolved oxygen content falls to less than 4½ ppm., the condition becomes lethal for trout.

Accordingly to keep water temperature low, the ponds are protected from the summer sun by spreading U. S. Army surplus camouflage nets over them on frames. Tests are made several times a day to determine the dissolved oxygen content of the ponds and, if below 5 ppm., water is sprayed into the pond to increase this element, so vital to fish life.

Each day, random fish specimens are taken from each pond and inspected in the laboratory for disease and for any evidence of dangerous parasites. There are over three million trout in the 36 ponds and main reservoirs, hence a contagious disease or fatal parasitical attack could result in a huge loss of the valuable fish.

Seasons, too, affect fish. In winter they eat less and use less oxygen. During warm summer months, when food and oxygen requirements are greater, ponds are aerated and water temperatures carefully controlled.

Once a day, trout are fed a balanced food diet comprised of ground beef, kelp, salmon meal, tomato pulp, wheat, wheat germ, yeast and vitamin B-12. Some 1,500 to 2,000 lb. per day of these ingredients are put through a grinder, then pelleted and fed manually to the trout.

The 12 ponds on the upper terrace are reserved for the youngest fish. As they near maturity, they are progressively moved to ponds on the lower terraces. To move the fish to a lower pond requires only the removal of the weir; the fish move on the flow of water to the next pond.

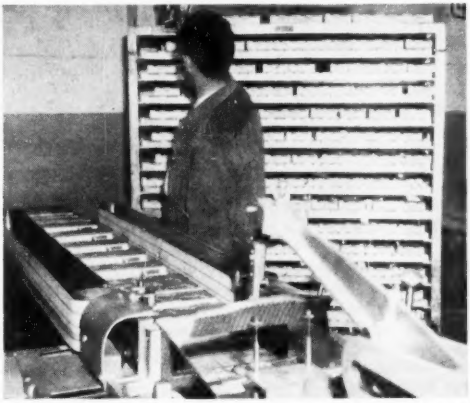
For Fast Cleaning

Connected to each pond is an 8-in. concrete waste pipe. It comes in at the floor of the concrete outlet and is plugged. For cleaning or emergency purposes, the water in any one pond may be quickly drained by removing the plug, without affecting the water level of the other ponds.

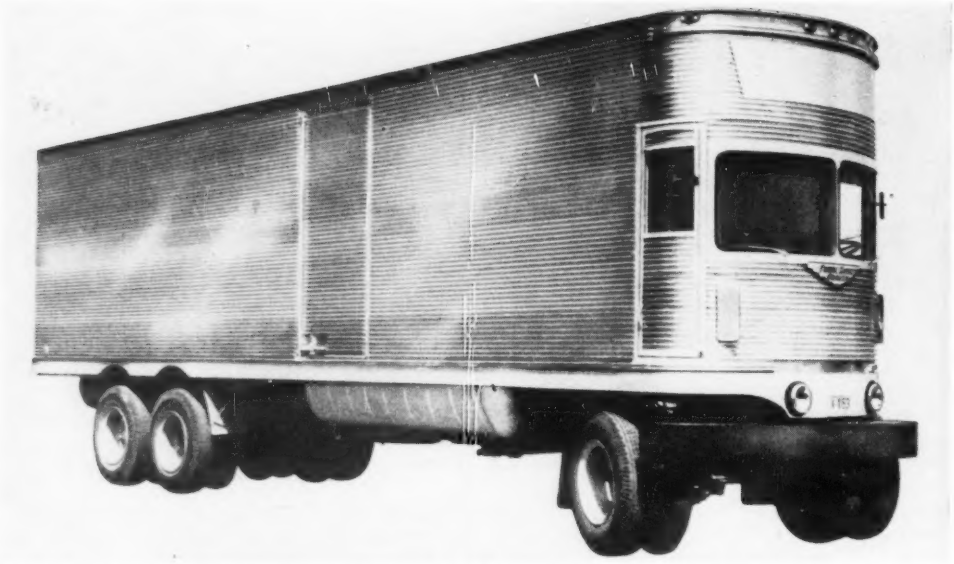
Fish remain in these growing-ponds for about 8 months. By that time they have reached a length of 8½ to 9

(*Turn to page* 196)

PACKING. Here, an operator selects four wrapped trout with combined weight of 1 lb. and places them in carton.



WRAPPING AND RACKING. Cartons get final wrap, which is also label. Then they are placed on freezer racks.



TRAILER capacity and truck operation combine to make this carrier a highly efficient hauling unit.

This Truck's Engine Is Tucked Under

Space normally given over to powerplant can be utilized as additional payload area in these motor-under-floor carriers designed for greater economy

"SELF-PROPELLED TRAILER" is an apt name for a new type of automotive vehicle, combining certain features of design of the modern motor bus and the stainless steel trailer to provide a truck of large volume-carrying capacity with short overall length.

The new vehicle may be driven by either gasoline or propane fuel (liquefied gas).

Called the Fageol Super Freighter, the truck is made by the Twin Coach Co., Kent, Ohio, working in cooperation with the Fruehauf Trailer Co., Detroit. It was designed by TCC's president, L. J. Fageol and it employs a standard Fruehauf trailer to which a driver's compartment has been added. It is driven by a Twin Coach motor bus engine mounted under the trailer floor.

The mounting of the driver's compartment and the engine, transmission, propeller shaft, axles, brakes, and steering mechanism are made at the Kent factory. The under-the-trailer floor location of the power was made possible by the pancake design of the engine, originally developed for the under-floor motor bus mounting.

Super Freighters are built around a wide variety and size of Fruehauf models and body types. Besides those for such dry freight as canned and other food products, the models include refrigerator bodies for perishable foods such as meats, milk, fruits and vegetables, as well as slat-sided vans for carrying livestock.

Use Full Length

The under-the-floor mounting of the engine permits the full utilization of the trailer body's load-carrying capacity. By adding the driver's compartment to the front end of the trailer and setting the front axle back under the driver's compartment, the Super Freighter has a longer body, hence greater payload capacity, than either a conventional or cab-over-engine truck of the same wheelbase or same overall length.

Compared with a conventional tractor-semi-trailer unit, the new truck has an equal body payload length. But since it doesn't include the tractor unit, it weighs from 5,000 to 8,000 lb. less and is from 8 to 10 ft. shorter overall.

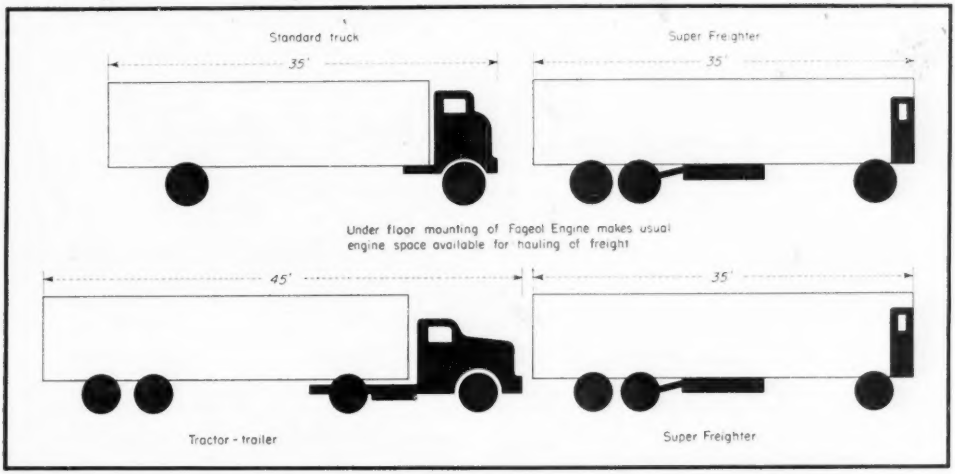
While the Super Freighter has equal or greater cubical load carrying capacities than conventional or cab-over-engine trucks and tractor-trailer units of equal overall length, the actual payload that can be carried is determined by the various state laws limiting axle weight allowances and gross allowable loaded vehicle weights.

For example, the State of Illinois allows a single axle loading of 16,000 lb., and a loaded gross vehicle weight of 24,000 lb. for a two-axle truck. A three-axle truck or six-wheeler (as the Super Freighter shown in the accompanying illustrations) is permitted 41,000 lb. Similarly, the Illinois gross allowable loaded weight of a three-axle tractor-trailer with a two-axle tractor and a single-axle trailer is 45,000 lb.

In practice, therefore, the maximum allowable gross loaded vehicle weight of the new truck in Illinois is 41,000 lb. The payload weight is 41,000 lb. less the weight of the vehicle itself.

Comparing the self-propelled trailer

Size Comparisons . . . Engine Details . . . Special Steering Aid



HERE IS HOW the new vehicle compares with truck of equal length and with tractor-trailer of equal capacity.

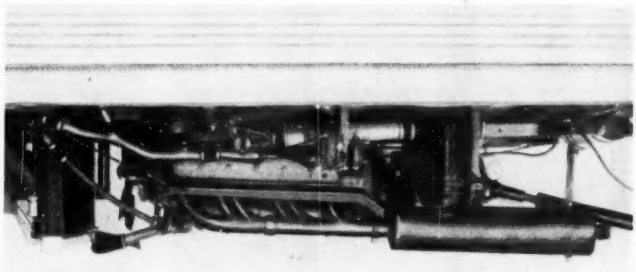
with a tractor and single-axle trailer having the same size of trailer body, and assuming that the tractor itself weighs 5,000 lb., the actual tractor-trailer payload would be 45,000 lb. minus 5,000 lbs., or 40,000 lb. less the weight of the trailer itself. But the weight of the trailer hauled by the tractor is less than that of the self-propelled trailer because of the addition to the latter of the engine powerplant, transmission, propeller shaft and driving instead of rolling rear axles.

The relationship of the above weights determines whether the self-propelled trailer can carry more payload weight than a three-axle tractor-trailer unit, and there is variation in the result when the different state laws are taken into consideration.

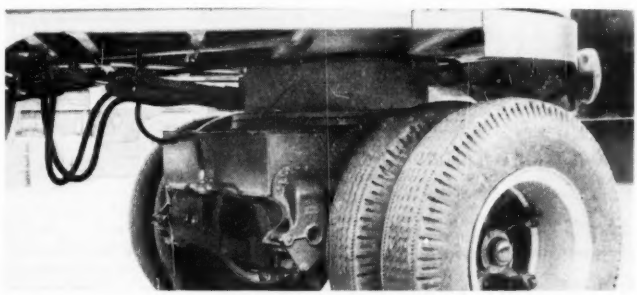
Good Bet for the Bulky

The Super Freighter, however, definitely has the advantage of a body of greater cubical capacity, and this is seen making it especially advantageous for bulky food loads—such products as crackers, cereals, potato chips, corn chips, and the like. This benefit is further enhanced if the new truck is employed to tow a separate four-wheeled trailer.

Specifications of the new vehicle can be adapted to individual needs and special operating conditions. The truck seen here utilizes a standard 31-ft. Fruehauf stainless steel trailer. The overall length is 35 ft. from bumper to rear door, with the driver's compartment taking up only 3 ft. 4 in. of the length. It has a net vehicle weight of 17,500 lb. and a rated payload capacity of 33,000 lb.



ENGINE-UNDER-FLOOR not only saves valuable load carrying space but, through use of propane gas, motor is more economical to operate and maintain.



FIFTH-WHEEL front axle steering mechanism, manually operated with help of a hydraulic booster, may be had for these dual-front-wheel models.

The powerplant consists of either a six-cylinder high-compression horizontal, or pancake, type gasoline engine, or the Twin Coach 10-to-1 compression propane engine in a size ranging from 162 to 250 Hp., as required. Either type is mounted on a weight-distributing subframe attached to the under-floor cross members of the trailer. The engine is protected against road dirt by means of a hinged aluminum housing, which may be dropped for engine maintenance and repair.

The make of transmission furnished is optional to provide any desired gear

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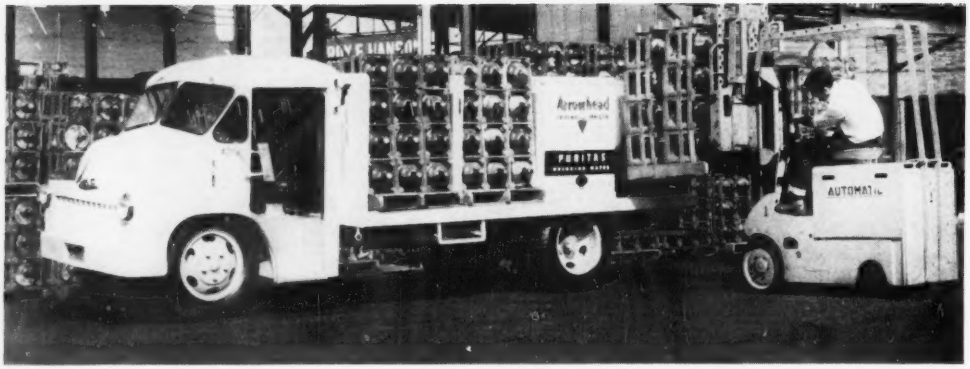
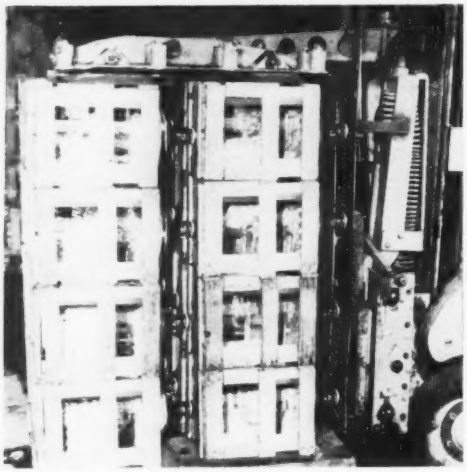
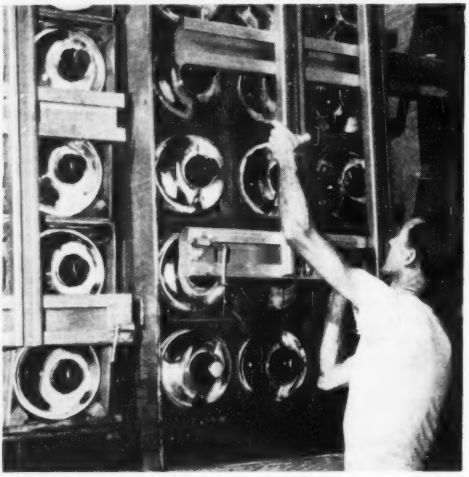


FIVE-GALLON bottles go on horizontally, 24 to a pallet. Loading time is halved.



LIFTING CLAMP holds crated bottles on pallets.



RETAINER fixture keeps bottles, pallets firm.

Loads More Bottles Faster, Safer

Distilled water company now trucks 1½ times as many by palletizing neck-out stacks, rigging with aluminum

JAMES JOSEPH
"Food Industries" Correspondent

Handling time cut in half, 50 percent more bottles per truck, and breakage reduced to a minimum are the results of a project by Arrowhead & Puritas Waters, Inc., Los Angeles bottler of spring and distilled water.

This company's handling problem involved its 5-gal. bottles—each individually crated. Here's what was done:

All loading operations were completely palletized—from conveyor to truck. Hand loading has been done away with, and the time is cut in half.

Placing the bottles horizontally, with the necks out instead of up, makes the 50 percent increase in load possible. From 18 to 24 of the 5-gal. bottles are stacked on each pallet for the town-delivery trucks. Thirty bottles, five rows high, comprise the pallet load for long-haul transport to the firm's seven distributing centers in Southern California.

Arrowhead did its own truck-body redesign to facilitate adoption of pallet handling and horizontal loading. Three special features did the trick.

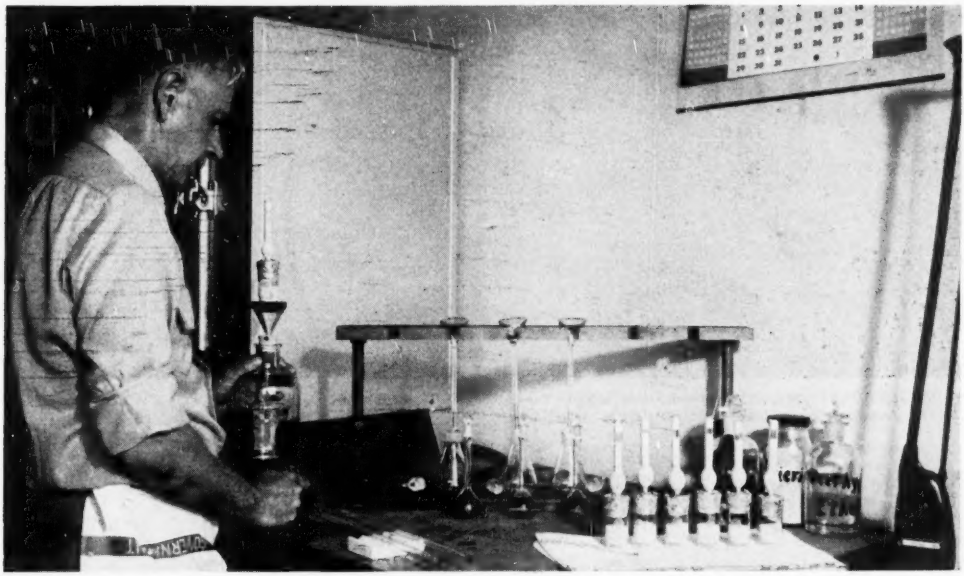
First came installation of pallet-sized partitions that prevent bottles on adjacent pallets from bumping during the ride. These are also especially helpful when unloading light empties.

Added next was an automatically-operated spring clamp that "hugs" the crated bottles to the pallet during fork-lift loading.

Aluminum Replaces Wood

And third, lightweight aluminum retaining fixtures replaced the heavy wooden ones. Comprised of C-shaped fabricated aluminum stakes, each new fixture has two vertical and three cross members. They weigh only 21 lb., compared to 75 lb. for their wooden predecessors. By means of the snug fit between bottle necks, the pallets and bottles are held firm during the trip. In addition, their ease of removal reduces unloading time and, consequently, drivers' fatigue.

PROCEDURE IS SIMPLE: Here, Author Shows Steps



HAVING dispersed purees in methyl alcohol and then filtered them through glass plugs in funnels on rack (center), Author Potter adds an aliquot to absorbent in preweighed crucible (left). Liquid will next be allowed to drain and absorbent will be washed with methanol and then ether, using gentle suction. Crucible and contents are oven-dried and reweighed after cooling. Later, the crucible will be heated to regenerate absorbent.

New Moisture Test Gives Faster Results

In hours instead of days, water contents of purees and concentrated fruit products are accurately gaged. Drying agent does the trick

EARL F. POTTER

Western Regional Laboratory, Bureau of Agricultural & Industrial Chemistry, Agricultural Research Administration, USDA, Albany, Calif.

A new method that rapidly and accurately determines the moisture content of fruit purees and concentrates has been developed at the Western Regional Research Laboratory.

The improved procedure employs a suitable desiccant to absorb moisture from a sample. The increase in the weight of the absorbent, corrected by a blank, represents the moisture content, of an aliquot of the sample.

Chemicals and equipment needed to carry out the test are available in most laboratories. And the technic is simple enough for routine analyses.

■**For industrial laboratories, this new method promises advantages, particularly in view of the rapidly expanding manufacture of fruit purees and juice concentrates.**

Approximate moisture contents of these products can be quickly obtained by Brix or refractive-index methods. However, these methods have not proved satisfactory. For the Brix procedure is subject to considerable error, and refractive-index measurements are difficult to make accurately when colored products are analyzed.

To obtain reliable results, it is necessary to employ the oven technic. But there is trouble with this method, too. It takes too long to get results—about two days are required.

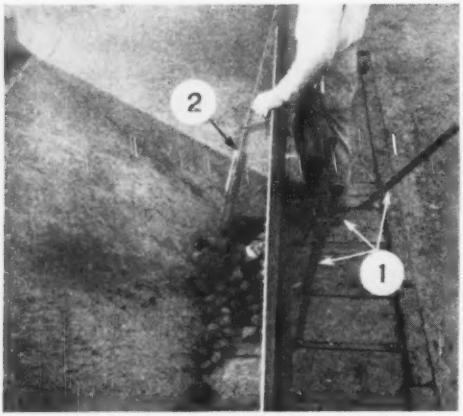
Here are the nine steps employed in the absorbent method:

1. Put weighed samples of fruit-juice concentrates into volumetric flasks, together with methyl alcohol; shake vigorously; and make up to volume. To prepare a homogeneous mixture of purees with methyl alcohol, use a mechanical blender. Put 3 to 5g. samples in a small covered blender cup, introduce a minimum amount of methyl alcohol, and mix at low speed for about 1 min. Wash down material adhering to the sides of the cup, and continue blending for another minute. Transfer contents to a volumetric flask and make to volume. (All glassware should be dried at 221 deg. F. before use.)

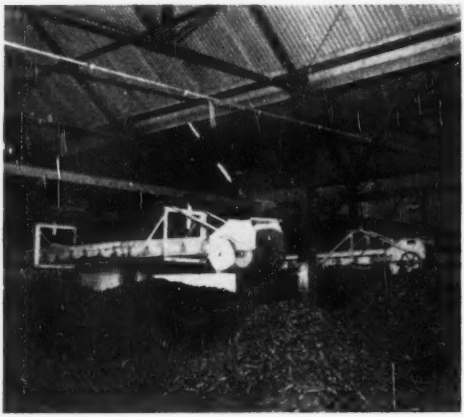
2. Place about 2g. of powdered and 13g. of 10-20 mesh Drierite• in a

(*Turn to page* 190)

• W. A. Hammond and James R. Withrow, "Soluble Anhydrite as a Desiccating Agent. I. Preparation and General Characteristics", *Ind. Eng. Chem.*, Vol. 25, 653, 1933; "II. Drying of Organic Liquids," *Ind. Eng. Chem.*, Vol. 25, 1112, 1933 . . . W. A. Hammond, "Use and Regeneration of Drierite", *Jour. Chem. Education*, Vol. 12, 445, 1935 . . . Mention of the product, Drierite, does not imply USDA endorsement or recommendation over other desiccants.



1 **VEGETABLES** are dumped directly into hopper. Levers (1) control false bottom. Arm (2) keeps outlet open.



2 **THREE** traveling conveyors, at right angles to main carrier, distribute vegetables over entire bin.

They Improved Their Processing 8 Ways

Better job at less cost results from canners' ideas on handling, tools, drives, water and waste—ideas worth checking for your own plant

IVAN C. MILLER
Editorial Consultant, "Food Industries"

Innovations ranging in scope from an item as small as a better hand fork to an ingenious plant waste disposal system have greatly improved operations at the Mammoth Spring Canning Co., Sussex, Wis.

These eight improvements cover unit operations in materials handling, processing, steam generation and, as indicated, disposal. Here's the story of what led to the changes, what was done to effect them, and what they accomplished:

1—Unloading Farmers' Trucks. Until recently, beets and carrots were shoveled by hand from the farmer's trucks into the cannery's storage bins. This was expensive in time and labor, and it was difficult to determine the tare.

The company improved the method by fabricating a receiving trough into which the contents of the truck are dumped. Beneath the trough is a chain scraper-type conveyor which empties onto an elevating conveyor feeding a rotary screen separator. Dirt, trash, and stones, are collected in a compartment below the screen separator, weighed, deducted from the gross, and returned to the farmer's truck. This avoids dissatisfaction over tare deduction, also saves the plant the cost of disposing of many truck loads of refuse.

When the beets or carrots are dumped into the trough they collect in heaps. The trough has a false bottom divided into removable sections, each controlled by a lever (see photo). This arrangement permits feeding the roots in sufficient amounts to maintain a steady flow without clogging the conveyor, breaking conveyor slats, snapping chains, or stripping gears. When the truck is empty and all the vegetables conveyed to the separator, except a layer on the false bottom, each section is successively withdrawn, allowing all vegetables and remaining debris in the load to go to the separator.

Only one section of the false bottom is open to the conveyor beneath while the load is being emptied and while the trough is full. Beets or carrots often lodge in this opening, disrupting the flow to the conveyor. When the system was first in use, vegetables clogged in the opening were forced through by an operator with a pole. But frequently this pole was caught by the moving conveyor slats, breaking it or damaging the conveyor. And some of the vegetables were mangled as a result.

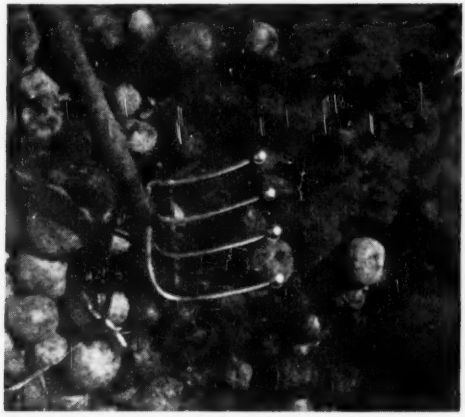
Now, a steel arm booted with wood is swung over the opening high enough to clear the false bottom and conveyor beneath. Hand operated, the arm describes a pendulum movement which keeps the opening clear—with little damage to the vegetables and none to the conveyor.

2—Better Bin Loading. From the separator, the beets or carrots are conveyed to the storage bin. Originally, an overhead belt conveyor discharged them into a single long pile down the length of the bin. But this method failed to utilize the available bin capacity.

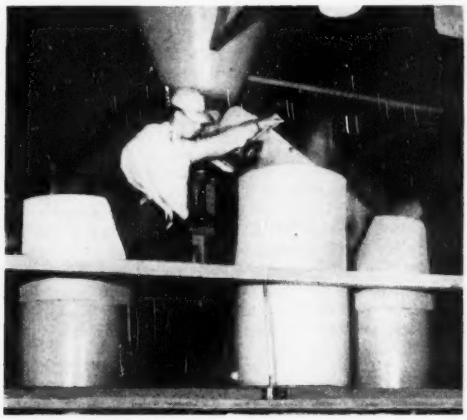
Today the same center conveyor discharges onto any or all of three travelling conveyors that distribute at right angles to the center unit. And so the full capacity of the bin is now used.

3—Tool Hazard Removed. Root vegetables are transferred from storage to the processing lines via flumes covered by removable wood floor sections. The flumes serve the dual role of conveyor and pre-washer. A continuous flow of vegetables into the flumes is maintained by raking. Here, the old sharp pointed rakes damaged the vegetables, often piercing them. Workers lost time removing roots from the rakes and the sharp tines were an accident hazard.

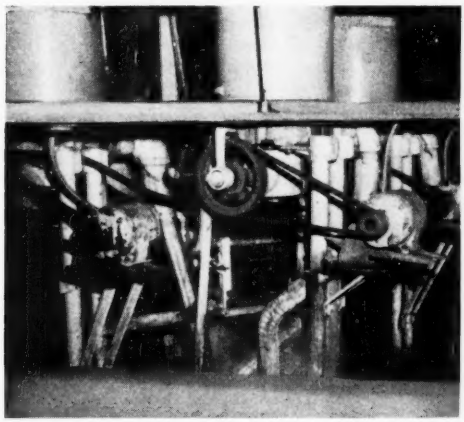
The answer was found in discarded ball bearings. A ball was welded to each rake tine (see photo) eliminating the sharp points. Further, a



3 **BALL BEARINGS** welded to fork tines speed operation, make tool safe. Note push bar fitted to back.

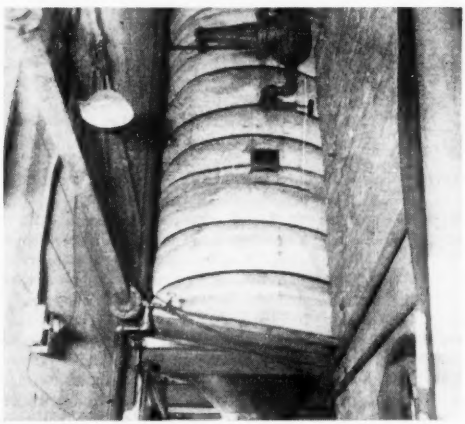


4 **BATTERY** of batch peelers is arranged in a circle beneath a feed hopper. Assembly is fed from swivel chute.



5 **IMPROVED** power transmission has been attained through use of V-belts to drive peelers.

6 **NOW IT'S EASY.** Cans from retort crate are placed in box on wheel-shelf and simple shove takes box away.



7 **THIS** water softener with continuous draw-off has reduced boiler cleaning from weekly to seasonally.

8 **TERRACED** hillside flumes provide area for waste water to evaporate and be absorbed. Odor is scant.

metal strap was welded to the back side of the tines to serve as a scraper or pusher. Loss of time, damage to product, and an accident hazard were removed.

4—Peeler Feeding Speeded. Both continuous and batch peelers are used following washing and lye peeling. The five batch peelers were initially fed by hand, a slow and fatiguing operation.

The new system of feeding the batch units avoids manual lifting and reduces the labor required to one operator for all five peelers.

Beets or carrots from the washer are fed to an elevated cone-bottomed hopper equipped with a swinging discharge pipe. Delivery to the peelers, arranged in a circle, is controlled by a hand-operated valve or gate in the discharge chute, which is swung from one peeler to the next for filling. Circular metal aprons, with a portion cut away to accommodate the swing of the chute, are attached to the top of the peelers to guide the flow of vegetables.

Each peeler is ready to dump in the time required to fill the remaining four. Dumping is manual—by a lever operated by hand or foot.

5—Machine Drive Improved. Until three years ago, the drives on the peelers were a constant source of trouble. Used then were flat belts from motors anchored to fixed bases. Belt slippage was common, not only requiring constant attention and frequent maintenance and replacement, but also putting a heavy and variable load on the motors and reducing the efficiency of the peelers.

The flat belts have now been replaced by V-belts and V-belt sheaves. And the motors have been mounted on cradle type bases to permit them to swing through a limited arc, thus automatically maintaining uniform belt tension. Since the change over,

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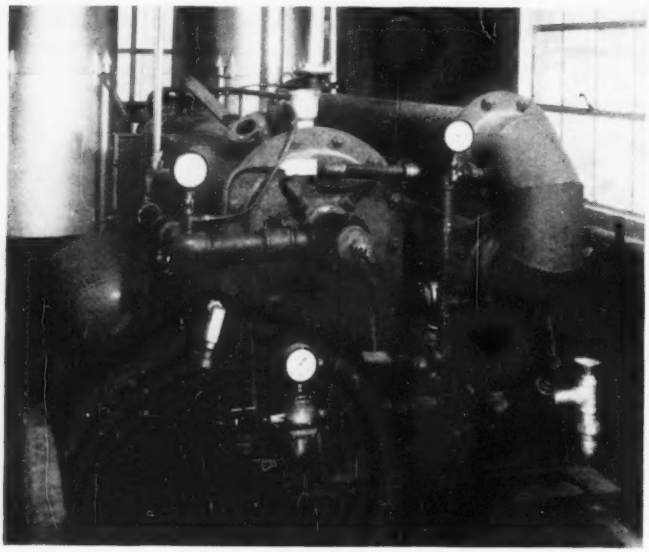


KEY UNIT in extraction-plant protection is this inert gas generator.

Gets New Safety and Big Savings By Extracting Oil in Inert Gas

Soybean firm's curbing of hexane-solvent hazard eases insurance requirements. Protection program cuts premium costs $6,000 a month

BY CONDUCTING its flammable-hexane extraction of soybean oil in a protective atmosphere of inert gas, Central Soya Co., Inc., Fort Wayne, Ind., initiated a saving of thousands of dollars a month in insurance premiums.

■ **This type of inert gas protection is seen adaptable as an added safety factor in the extraction processing of other beans, as well as nuts and vegetable products.**

Adoption of the inert gas system was the key in the company's broad safety program, which also included emphasis on sprinklers, fire walls and doors, and improved ventilation. A total of 500 insurance policies had formerly been carried to cover the firm's three plants. This number has now been reduced to 3. The savings are calculated at approximately $6,000 per month in premiums.

The soybean company installed a Roots-Connorsville inert gas generator at each of its plants—in Decatur, Ind., Marion, Ohio, and Gibson City, Ill. One unit cost about $5,000 plus installation. Each generator is located in a building separate from the extraction tower itself.

The inert oxygen-free gas produced is blown through the tower as needed, both during shutdowns for purging and when the tower starts up again. Thus, hexane solvent is introduced into an inert atmosphere well below the combustion range.

Increases Production Time

Norman Kruse, vice-president and technical director of the firm, says, "Not only do these generators give us additional protection required by underwriters and desired by ourselves for our employees, but they considerably reduce down-time when extraction towers are purged every 5 or 6 weeks. Productive time is accordingly increased."

The striking decrease in the costs of insurance required to cover Central Soya's three plants may also be partly credited to the general safety program emphasizing sprinkler systems, fire walls and doors, and ventilation.

It is pointed out that the new insurance extends coverage to periodic variations in inventory—raw materials, materials in process, and finished goods.

Firemen's Mutual Insurance Co., which services the soybean firm, says that similar hazards of industrial organizations can be reduced to a great extent, with resultant simplification of insurance handling, lower premiums, and more positive insurance protection.

We Think . . .

■ Need for Cautious Food Law Revision Indicated at Hearing

In contrast to the first Washington hearings by Delaney's Congressional committee on chemicals in foods, the session in Chicago in November brought forth extensive testimony from several leading food technologists. Reported in detail elsewhere in this issue, this testimony makes a lot of sense and may well set the foundation for future revision of the Food, Drug & Cosmetic Act.

The concensus among the technologists who testified was that revision of the federal law is advisable, that new chemicals should be tested thoroughly and long before being added to foods or used as insecticides, and that the burden of proof that such chemicals are harmless should be placed upon the chemical manufacturers, not on the Food & Drug Administration.

We think that the testimony of Roy C. Newton, Swift & Co.'s vice-president in charge of research and a leading food technologist, is typical of the sound thinking expressed. Dr. Newton believes that the food processor has a moral obligation not to add a chemical to a food, or change a product by chemical processing, without adequate proof that the addition or change is harmless. And he feels that the food technologist should use equal precaution in respect to insecticide and defoliant residues and plant harmones.

Revision of the federal food law, in Dr. Newton's opinion, is warranted. And such revision should clearly present the requirements which must be met to secure approval of a new chemical in food. And it should also protect the processor against any arbitrary ruling by an administrator which may be unsound in a practical sense and against public interest in that it impedes technological progress.

The latter two requirements of a revision of the food law are extremely important. Experience with food standards has amply demonstrated this. Only by following industry advice can damaging impracticality be avoided. And only by decisions based upon realities—plus revisions and impartial rulings in light of new data—can the impediment of progress in food processing be avoided.

We believe that food processors would welcome revision of the food law. But leaders in the industry should have a big hand in shaping the provisions of that revision.

■ Vital Value of Food Technology Demonstrated in Philippines

Dramatic demonstration of the vital value of improved nutrition through the application of technology to food processing has come out of the Philippines. It is estimated that the lives of 220 Filipinos have been saved in less than two years by providing enriched rice to some 65,000 in Bataan to combat beriberi. Immeasurably better health was brought to 3,500 others who ate the fortified product.

This successful mass experiment in nutrition was part of a plan for a world-wide attack on beriberi formulated by Dr. Robert R. Williams, chairman of the Williams-Waterman Fund Research Corp. and the man who first synthesized thiamine.

The enrichment technic (FI, Nov., 1948, p. 96) involves the mixture of highly enriched grains to polished rice which has gone through the usual milling operations. This fortified "premix" is prepared by spraying the rice grains with enriching solution containing vitamins and minerals, drying the grains, then applying a protective coating consisting of a fatty acid in alcohol to retain vitamins in cooking.

The premix is prepared in central plants and one part to 200 parts of ordinary white rice is introduced at native mills by inexpensive blenders. Cost of enrichment is insignificant—20 to 35 cents per consumer per year. The blended product compares favorably with brown rice in thiamine, niacin and iron—the latter two substances helping to combat other deficiency diseases than beriberi.

One of the secrets of the phenomenal success of the enriched rice lies in the fact that it is similar in color and taste to white rice and is liked by the Filipinos. Previous attempts to introduce improved forms of rice to these people failed because they differed in appearance and flavor.

It is to be expected that millions of rice eating people in the Orient eventually will enjoy the great health benefits afforded by this nutritional advance. And rice enrichment is an excellent example of what American technology can do for backward areas.

■ Management Must Raise Its Profit Sights to Pay for Progress

It's time for all food processors to change their concept of what constitutes an adequate margin of profit. This is important because profit to a manufacturer is similar to take-home pay for a worker. Both represent buying power. For the worker, buying power represents the necessities, luxuries and security in life. For the manufacturer, it represents progress through research, modernization and expansion. In extreme cases it may represent mere high-cost replacement of worn-out facilities to stay in business.

And just as workers have needed more take-home pay to maintain and improve their standard of living, so manufacturers must have more profit to maintain and improve their facilities and products.

How much more is required? Here are a few clues. National Industrial Conference Board reports that today's construction dollar is worth but 46 cents in buying power as compared with 1939. It's the same way with food plant machinery. As an example, Quaker Oats Co. today pays $2,700 for an oat huller which cost $820 in 1940. Belting which was $4.78 a foot in 1940 is now $9.79. And other items are up proportionately.

Since most food processors finance modernization and expansion out of profits, the margin between income and expenses should be nearly twice the 1939 ratio, or about 9 cents on the sales dollar. To achieve this would mean tripling the average current profit level.

It may seem unnecessary to urge a manufacturer to try for higher profits. Every company works to that end day in and day out. But the point is that a firm may really be doing very badly profit-wise when the black figures equal

those traditionally considered satisfactory in the industry.

And it is much easier to suggest higher profits than to achieve them. It is especially difficult to improve the net in the face of high labor and raw materials costs. Today's dollar purchases only 41.7 cents worth of raw materials and 43.3 cents of labor compared to 1939. Then, of course, industry faces an excess profits tax and price restrictions which will further complicate matters.

But if one doesn't set the proper goal, he is never likely to achieve it. Then it is important, too, that food processors educate the public, the Congress and organized labor to the need for much higher profits. All should be made to understand that the earnings of industry must be maintained at a high level if our economy is to expand and prosper. Without high earnings, there will be insufficient funds to finance the modernization and progress essential to a strong future economy.

The toughest job faced by food processors is, of course, raising profit levels to the right figure. This should be approached by making an organized project of cost reduction through modernization, together with work simplification and other means for raising worker productivity. Some particular individual in a small plant, and some department in a large plant, should be saddled with this responsibility and backed—nay, pushed—by top management.

■ Wise Management Explains How Work Saving Makes Jobs

It is good management practice to tell workers the why's and wherefore's of a new machine or process which produces more with fewer employees. Then the people working on and around the new unit will not get the layoff jitters nor stage a slow-down which cancels the benefits of modernization. It's not always easy to put into simple convincing language the truths about the job-making aspects of progress. But it can be done.

Take, for example, the little story in a meat-packer's house organ about the company's new bacon wrapping machine. The story leads off with the fact that the new machine will do thirteen times the work of a hand operator. Then quickly comes the countering comment and we quote:

"It is not primarily a labor-saving device and will not eliminate thirteen people's jobs. First, it cannot eliminate thirteen jobs when only four people are presently doing the work. Secondly, even these four jobs did not exist until a few weeks ago.

"Customer demand and keen competition have forced the new package upon us, and in so doing have really created new jobs. The permanently created jobs are those necessary to supply, operate and maintain the machine. Temporary jobs also were created in that it was necessary to use a hand operation pending the delivery of the new wrapping machine.

"The sliced bacon department is a good example of the customer being the boss. In fact, if it weren't for the customer's demand for service and convenience, this department wouldn't even exist. This machine is an outgrowth of that demand and an indication that we intend to stay in the swim."

The item might have added that machines which do things faster reduce the cost and increase consumption, thereby providing more jobs all along the line—from the receiving to the shipping department, as well as in the office. But the story made its point—one which should be put across in every plant each time a work-saving step is taken.

■ Prepackaging Not Enough—Refrigeration in Stores Needed

Prepackaging of produce seemingly is not the complete answer to spoilage prevention that certain enthusiasts have inferred. Otherwise the Produce Prepackaging Association would not now be embarked on a campaign to get refrigeration into retail outlets to reduce the losses due to spoilage. Figures cited by Dr. Charles W. Hauck, U. S. Department of Agriculture, indicate that annual losses caused by improper handling and inadequate refrigeration at the retail level run from 5 to 30 percent on a tonnage basis, and about 20 percent on a dollar basis.

In retrospect, it looks like a repetition of the experience of the frozen food manufacturers in the Thirties—when they were greatly handicapped by lack of adequate freezer storage in retail establishments. If it had not been for the efforts of the late Gardner Poole and the resources of General Foods Corp., the development of the economic freezer cabinet would have been greatly retarded. Mr. Poole's insistent needling brought about the change.

It remains to be seen whether the green-grocery trade can be convinced of the value of further refrigeration, and whether the Produce Prepackaging Association can find an equivalent to Gardner Poole.

■ Picayune Restrictions Bother Margarine Manufacturers

Margarine interests are not fully satisfied with the relief granted them by Act of Congress on July 1. When they will make the next move to secure further action by Congress is not evident. But one particular part of the law could well be repealed.

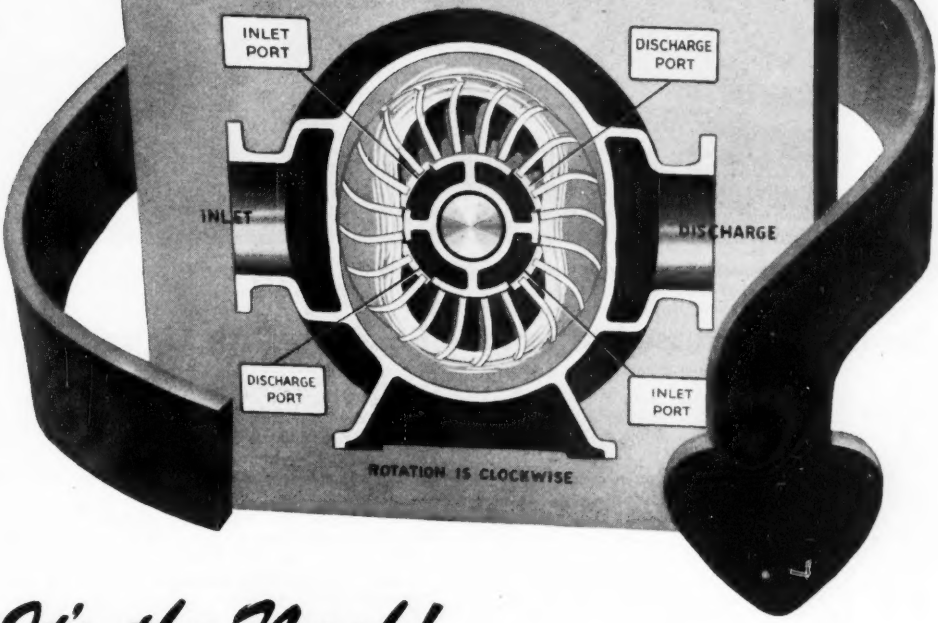
We refer to Section 407 (b), which provides that margarine may be sold only under certain restrictions as to size of package, size of the letters on the package, and minimum type size. These provisions were inserted just before the law was passed.

Equally silly are some of the rules regarding use of margarine in restaurants and public eating places. Signs stating that a butter substitute is used and served are the lesser of these discriminatory requirements.

Pending modification of such restrictions, how can the Food & Drug Administration police the public dining rooms of the country? Suppose that each one of the 525,000 such eating places were visited by an inspector once a year. This would cost about $5,000,000, plus a substantial expenditure for the necessary new equipment and laboratory facilities. In other words, the entire appropriation to run F&DA would be needed for this one little job of finding out whether the restaurants serve their pats of margarine only in triangular form and have suitably conspicuous signs hanging on the wall. One doubts that F&DA will stop all other inspection activity to do this chore.

Picayune restrictions can be costly in more ways than one.

This is Why the Nash is the Most Simple Compressor



It's the Nash!

There are no mechanical complications in a Nash Compressor. A single moving element, a round rotor, with shrouded blades, forming a series of buckets, revolves freely in an elliptical casing containing any low viscosity liquid. This liquid, carried with the rotor, follows the elliptical contour of the casing.

The moving liquid therefore recedes from the rotor buckets at the wide part of the ellipse, permitting the buckets to fill with gas from the stationary Inlet Ports. As the casing narrows, the liquid is forced back into the rotor buckets, compressing the gas, and delivering it through the fixed Outlet Ports.

Nash Compressors produce 75 lbs. pressure in a single stage, with capacities to 6 million cu. ft. per day in a single structure. Since compression is secured by an entirely different principle, gas pumping problems difficult with ordinary pumps are often handled easily in a Nash.

Nash simplicity means low maintenance cost, with original pump performance constant over long periods. Data on these pumps sent immediately on request

No internal wearing parts.

No valves, pistons, or vanes.

No internal lubrication.

Low maintenance cost.

Saves floor space.

Desired delivery temperature automatically maintained.

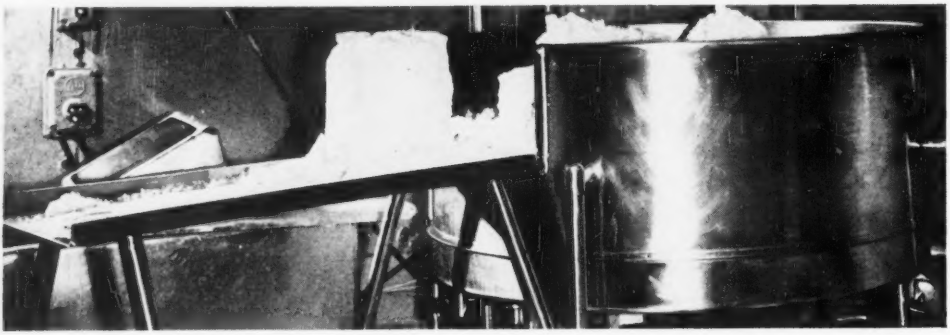
Slugs of liquid entering pump will do no harm.

75 pounds in a single stage.

NASH ENGINEERING COMPANY

313 WILSON, SO. NORWALK, CONN.

Food Equipment News



Frozen cream is liquefied at rate of 5,000 lb. an hour in this all-stainless-steel unit.

Sanitation Stressed in Unique Rotating-Disk Liquefier

Outstanding among the many features of this all-stainless-steel centrifugal liquefier of frozen ingredients is its highly sanitary construction enabling quick exposure of all parts for cleaning.

Unit may be used to liquefy frozen cream, butter and other ingredients preparatory to their use in the manufacture of ice cream, sour cream and standardization of table cream, and also for eggs, chocolate and other unfrozen products.

Here is the operating principle: Latent heat of condensing steam is transferred through a rapidly revolving stainless steel disk to the material to be liquefied. Latter is held stationary while the heating surface moves rapidly.

The liquefier utilizes this high heat content of condensing steam, high rate of heat transfer due to velocity between heating surface and ingredient, centrifugal force that removes the melted product from the heating surface, and centrifugal force for removal of condensed steam from the heating surface.

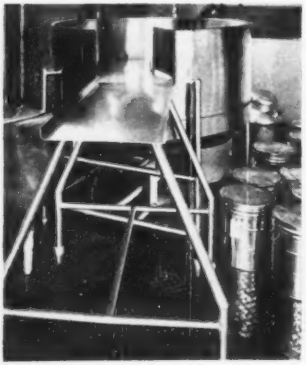
In liquefying cream, for example, the cream is removed from its container along the loading trough and falls onto the rotating disk. It is carried around until it meets the stop plate, this continuing until the disk is loaded. The whirling steam-heated disk transfers its heat to the cream and melts it.

The liquid product is thrown centrifugally against the breast ring that surrounds the disk, and runs by gravity to the collecting trough below. It is removed from the trough by gravity and can be either pumped or gravity-transferred to the desired point.

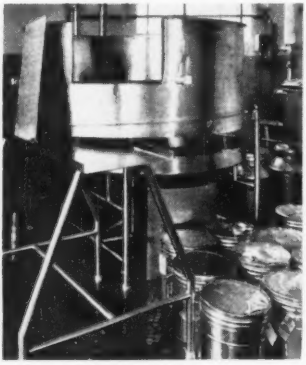
In the top photo, 50 percent frozen cream is being liquefied at rate of 5,000 lb. per hr. (output varies according to initial temperature and final temperature desired).

Varying speed of the disk and steam pressure provides flexibility in the rate of liquefaction. Since it is possible to bring the liquid off at any temperature, "oiling off" of fat can be prevented. And products are liquefied without any dilution.

All parts are quickly exposed for cleaning



Assembled unit



Feed trough removed

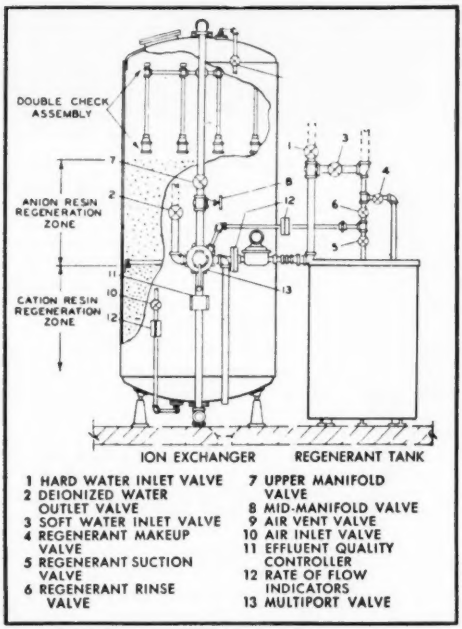
Rotating disk, collecting trough

This unit can be set up at any point in the plant, eliminating bringing cans into the pasteurizing room.

Overall dimensions are as follows: Floor space required is 52 x 52 in. Height is 50 in. Diameter of liquefying plate is 50 in. Loading trough is 16 x 19 in., and with extended legs requires floor space of 49 x 30 in.

The disk is rotably mounted on a 2-in. stainless steel pipe which is carried by ball bearing pillow blocks. Steam is fed, and condensate removed, through this pipe. Vertical motor rotates the disk by a chain drive.

Motor, drive mechanism, stuffing boxes and steam connections are in a stainless steel enclosure below the heating disk. Motor is 3 hp., and a total of 10 to 20 boiler hp. are required for operation.—*Bryant Machinery Co., 67 van Reipen Ave., Jersey City, N. J.*



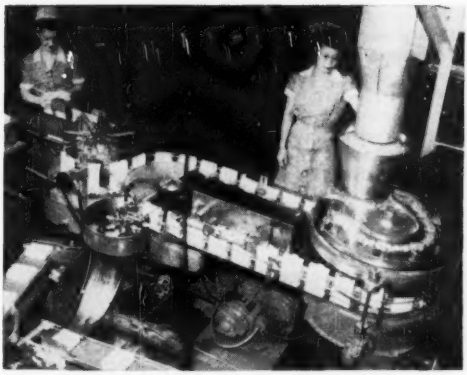
Single-Tank Deionizer for Water

Recent development in the water conditioning field is a single tank deionizer claimed to yield water of high quality at low cost. In addition to producing mineral-free water, the deionizer is stated to completely remove silica and CO_2 —an essential requisite for high pressure boilers.

Tests show that the specific resistance is above 5,000,000 ohms for water from the new deionizer.

Two types of resinous zeolite exchangers are used—one for the cations, one for the anions. Former is regenerated by a dilute acid solution, latter by a caustic solution. Instead of requiring separate exchanger tanks, the two exchangers are intermixed in a single tank. Marked difference in density permits them to be divided by backwash into two zones for separate regeneration, as illustrated. Simple manipulation of the multiport valve and supplementary controls accomplish: (1) Backwashing, (2) regeneration, (3) mixing the zeolites, and (4) return to service.

An important feature of this equipment is its "double-check" manifold arrangement that guards against loss of zeolite during backwashing, and permits use of deeper beds for more capacity.—*Elgin Softener Corp., Elgin, Ill.*



Fills Frozen Foods at 225 Boxes a Min.

A recently perfected high-speed automatic packaging process for free flowing items is reported to enable frozen food packers to fill up to 225 packages per minute.

Using an end-fill carton, called Marapak, in combination with a specially built machine, the new method is said to have shown excellent results in speed and economy.

The new package is made of solid bleached board, heavily waxed inside and outside, with a special lock at either end. It is of standard retail size, having the same dimensions as the top-opening hinged-cover package now used for most frozen foods. Overwraps currently in use will fit the new carton exactly.

Tests indicate the new carton is effective in excluding air, and it is termed fully as moistureproof as packages now used. Further, because of its construction, less paperboard is used, hence, the new flat, before being filled, requires considerably less storage space.

The machine, tradenamed the Marapak Unit, is designed to set up, fill, and close the cartons. Photo shows machine in operation at plant of Seabrook Farms, Bridgeton, N. J. Requiring only two operators, it works as follows:

Carton flats as they are received from the manufacturer, are placed in a magazine. Then the machine opens the package, closes the bottom lock, and sends the carton on to the standard volumetric filler, after which the package moves on to be locked. An automatic take-off device drops the packages into two lines of delivery to wrapping machines. Two wrapping machines, each capable of speeds up to 125 a min., are needed for each packing machine.

Pilot model machine was out last February. Since then

DON'T MISS THESE . . .

Device rapidly measures nut moisture by electronics, no weighing being required.....Page 94

Unit unloads cased bottles automatically, is driven by washer.....Page 96

New elevator is adjustable for bottle size, employs small rubber lugs for grippers.....Page 97

Pump redesign simplifies maintenance and provides better operating characteristics.....Page 98

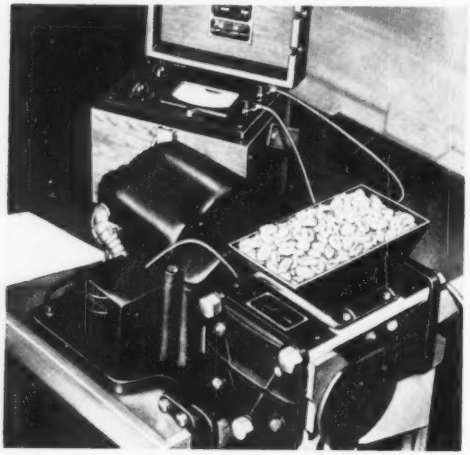
AND WATCH FOR . . .

Efficient, economical drum and barrel covers made of neoprene-impregnated paper...In February FI

Small weigh-belt feeder for dry chemicals or other dry materials has 3 cfm. capacity. In February FI

it has been tried out by frozen food packers on both west and east coasts. Among the products packed were peas, mixed vegetables, lima beans and cut corn. The machine handles either fresh or pre-frozen products. Since free-flowing items constitute 68 percent of the total pack, the new combination is seen playing an important role.

Present plans call for exclusive distribution of the machines through a service company on a rental basis. It is expected that they will be available for 1951 production in limited quantities. The machine is manufactured by the Sprague-Sells Div. of FMC for—*Marathon Corp., Menasha, Wis.*

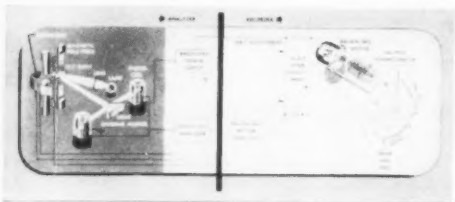


Rapidly Measures Moisture In Nuts

Newly reported is an electronic instrument for determining the moisture content of several varieties of nuts.

Known as the Model 8003 Tag-Heppenstall nut meter, it is described as an accurate conductance type instrument that will give readings in a few seconds. One of the important features is that samples don't have to be weighed. Newly published are calibrations for varieties of peanuts, walnuts, pecans and almonds, with others in preparation.

Prototype of this nut meter is the company's moisture meter for grain, which the maker states is the only rapid electrical moisture tester approved for use by the U. S. Department of Agriculture.—*Tagliabue Instruments Div., Weston Electrical Instrument Corp., 614 Frelinghuysen Ave., Newark 5, N. J.*



Oxygen Analyzer Is Highly Accurate

A revolutionary advancement in the field of oxygen measurement and control is reported achieved with a new analyzer.

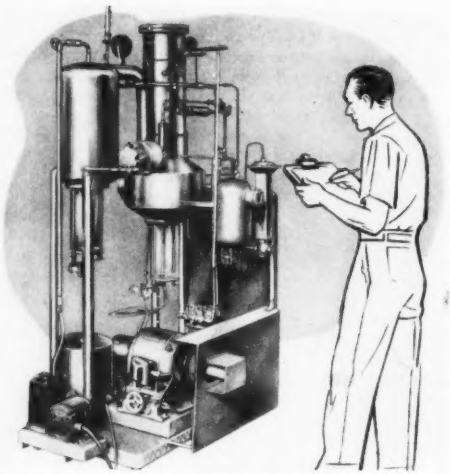
Specially developed during the war, this unit was only recently released for general industrial and scientific applications. Its accuracy and sensitivity are claimed to surpass that of any method of oxygen determination heretofore available. The principle is termed so simple and the operation so trouble-free that the instrument is readily adaptable to virtually any field of oxygen measurement—power plants, food processes, scientific research.

Operation of instrument is completely automatic. No chemicals are used. Measurement is made directly on gas sample as received, without need for saturating the sample or performing any other operations which might alter its composition. Further, the analyzer does not depend upon secondary changes in other properties, such as thermal conductivity or viscosity, but makes a direct measurement upon the oxygen content itself. Thus, sensitivity to even minute changes in oxygen concentration are assured, and accordingly there is maximum accuracy.

Measurement is based on the fact that oxygen is unique among gases in being strongly paramagnetic (attracted into a magnetic field), whereas other common gases, with few exceptions, are slightly diamagnetic (repelled out of a magnetic field). This paramagnetic property is so outstanding in oxygen that it is possible to determine oxygen concentrations of only a few parts per million by measuring the magnetic susceptibility of the gas being tested.

Basic operating parts comprise a light dumbbell-shaped element made of two small hollow-glass spheres supported on a quartz fiber (as indicated in the accompanying diagram). The glass spheres are free to rotate in a non-uniform permanent magnetic field and are subjected to a magnetic force which is proportional to the difference between the volume magnetic susceptibility of the glass spheres themselves and the gas which the glass spheres displace.

In this instrument, the glass test body is metal-coated to make it conductive. Near the test body are two electrodes maintained at fixed electrical potentials. A beam of light



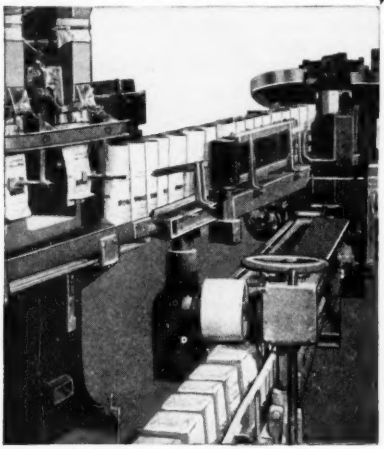
Low Temperature Evaporator for Lab

Laboratory-sized Lo-Temp evaporators are now available. This one can evaporate ¼ lb. of water per minute. Initial users are said to have found them ideal for low temperature concentration of heat sensitive fluids, distillation and fractionation of solutions, and for experimental distillation of flavor extracts and essences. Installation requires power and refrigerant lines.—*Mojonnier Bros. Co., 4601 W. Ohio St., Chicago 44.*

THE BEMIS DELTASEAL BAG *PLUS* DELTASEAL PACKAGING EQUIPMENT

Equals

The most Economical, Efficient Package for Your Product



- Deltaseal® filling and closing is fast... mostly automatic... less handling.
- Deltaseal Bags have a neat, square, full-pack appearance... build easily into eye-catching displays.
- Crisp, brilliant Bemis printing on Deltaseals headlines your brand.
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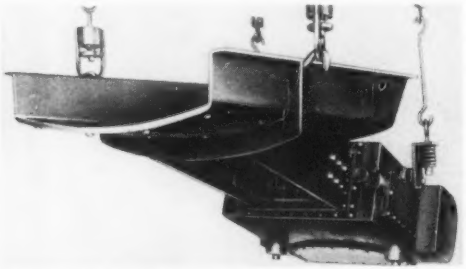
Salt Lake City • San Francisco • Seattle • Vancouver, Wash. • Wichita • Wilmington, Calif.

Bemis

reflected from a mirror attached to the body is divided by a prism to strike two photocells that are in electrical balance when the test body is in null position. Any rotation of the test body causes the light beam to divide unequally between the photocells. Thus, there is created in the circuit an electrical potential, and this is amplified and used to automatically indicate changes in oxygen content.

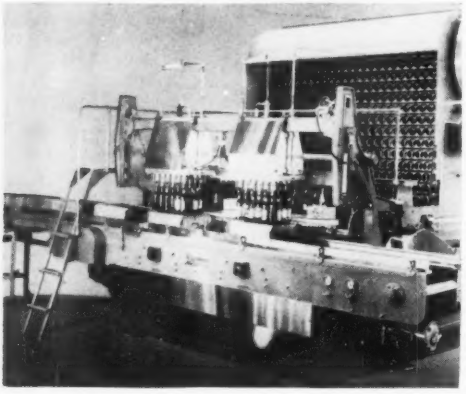
Maker states that, since changes in oxygen partial pressure are accurately and linearly translated into voltage changes that can easily be recorded, virtually any standard recording potentiometer, either circular or strip chart, can be modified for operation with the analyzer.—*A. O. Beckman, Inc., 11 W. State St., Pasadena 2, Calif.*



Dust-Tight Vibratory Feeder

Dust-tight model of heavy-duty Vibra-Flow vibratory feeders has its leaf springs, armature and core covered by gasket-sealed plates bolted to the magnet casting, as shown in photo. Thus, protection is obtained against clogging by excessive supply, hopper spillage or heavy dust conditions, and the feeder is suitable for Class 2, group installations.

Feed rate on this model ranges to hundreds of tons per hour of bulk materials.—*Syntron Co., 460 Lexington Ave., Homer City, Pa.*



Unloads Cased Bottles Automatically

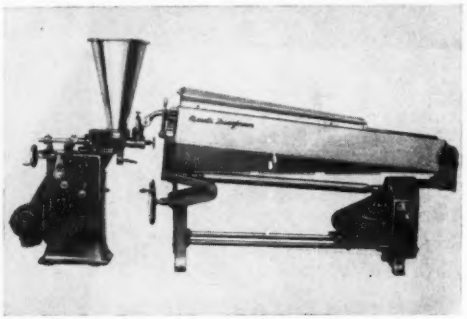
Full or half depth cases and cartons can be handled by a new automatic case unloader.

Known as the Meyer-Dumore case unloader, it extends but three feet beyond the standard loader, and is driven by, and becomes part of, the bottle cleaner. This eliminates numerous individual drive motors and difficult returning operations.

Two cases of bottles are automatically placed and locked into position on the case conveyor under the unloader head. The locking precludes lifting of the case onto the infeed table in event of a bottle jamming. In operation, air operated lift fingers gently close around the neck of bottle. And, a bottle may be slightly off center and still be picked up. Crowned bottles are rejected.

Bottles are smoothly lifted from cases and placed on infeed table in motion with the infeed chain, reducing chance of tippage to a minimum. Bottles then move forward through stainless steel guides to tilting cradles, where they are lowered to a horizontal position and gently pushed forward, by individual loader fingers, into the carriers.

Safety stops are provided at all strategic points in bottle travel, preventing damage to machine and bottles. Unloader head may be raised to permit hand feeding.—*Geo. J. Meyer Mfg. Co., Milwaukee.*



Simplifies Filled-Candy Production

This assembly, comprising a new filler and batch former, has simplified production of filled-candies.

Filler unit (known as the Type 27-C) is seen at left in the photo. It pumps the filling directly into the rope of candy just before it leaves the batch former (right in photo), with the result that the center is surrounded by a uniform jacket of candy. Machine is recommended for semi-firm as well as liquid centers.

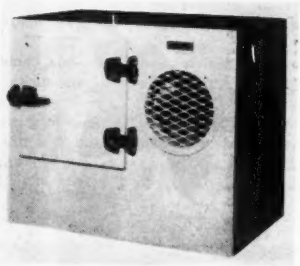
Required rate of filling is easily regulated by means of a simple scale. Change of filler as well as cleaning requires only a few minutes.

The batch former differs from the usual spinner or roller in that the sugar rope, filled or unfilled, is formed and presized automatically and requires no manual labor in its sizing. Mechanism of the unit permits the direct addition of sugar casing to a batch still being worked.

Maker states this machine specifically answers the problem of producing filled goods in an uninterrupted process without waste. The attendant merely has to watch the process and add casing and filling as required.—*Package Machinery Co., East Longmeadow P. O., Springfield, Mass.*

Want *More* Information?

It's free—and easy to get. Simply note here the items on which you want more details, then turn to the Reader Service section inside the front cover, where all are listed by pages and by subjects under, "Editorial: New Equipment, Supplies"—each one with a page key number after it. The key numbers also appear on the handy Reader Service postcard. So you circle those for the items that interest you, sign at the bottom, and mail. No postage is needed.



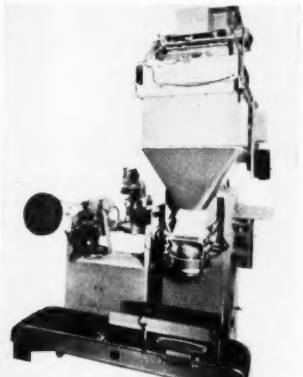
Transport Cooler Uses Dry Ice

A compact transport refrigeration unit that replaces the conventional mechanical condensing unit with dry ice is now announced. Advantages of low cost and simplicity of operation and maintenance are claimed for the new unit.

An 18x23x28-in., 185-lb. unit, using 50 lb. of dry ice, cools 350 to 400 cu. ft. Temperature control is maintained through a thermostat and solenoid valve.

Forced air circulated by a 6v., 7-amp. fan assures control throughout the refrigerated area as well as fast action in removing heat gains. System is hermetically sealed and operates on a natural gravity flow. A finned evaporator coil is used, and Freon is the refrigerant.

Unit mounts on brackets inside truck, can be easily removed if no refrigeration is required.—*Dyna-Kold Corp., 3221 20th St., San Francisco 10.*



Gravity Packer Handles Paper, Textile Bags

There are two sewing heads in this gravity packer, one for textile, one for paper bags. One not in use is swung out of way. Change-over is accomplished simply by swinging proper head into place.

Tests with the packer for free-flowing commodities show, states maker, that one man can pack from 5 to 7 bags a minute, two men up to 12. It is a combination filling, weighing, and bag-closing unit for use with either cotton or paper.

Suitable for a weight range between 50 and 140 lb. and reported accurate within 2 oz., it consists essentially of a net weighing scale, a pneumatically-operated oscillating mechanism that settles the contents of the bag, a dual bag-closing unit that will sew either multi-wall open-mouthed paper or textile bags, and a conveyor.

Conveyor is composed of four V-belts conclavely arranged so filled bags will stand upright unassisted as they pass from packing spout to sewing head.—*Bemis Bros. Bag Co., St. Louis 2.*

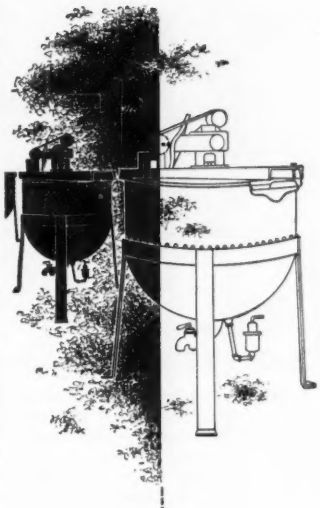
Elevator Adjustable For Bottle Size

More efficient use of floor space is now possible in plants producing bottled goods through the use of a recently developed bottle elevator.

Dirty-bottle storage and washing equipment can, for example, be located on one floor, while filling, casing and sealing equipment are accommodated on the floor above.

Elevator consists of two Model L chains, faced with small, corrugated hard rubber lugs. In operation, the flat surfaces of these lugs contact the bottles on both sides, first moving them horizontally, then almost vertically from one floor to another (see photo).

Short, straight sections of slat chain, at the inlet and outlet, take bottles to and from the elevator. Machine can be adjusted to accommodate various size bottles.—*Mojonnier Bros. Co., 4601 W. Ohio St., Chicago, 44.*



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The answer to easier clean-ups is a simple five letter word, M-E-T-S-O. Try it and know how fast Metso acts on dirt and grease films; how effectively it holds the dirt suspended. Then see how it all rinses away, leaving clean, greaseless, bright surfaces.

You will agree that clean-ups are easier with Metso Detergent. It's the right combination of alkali, controlled by soluble silica that increases the rate of dirt removal, yet curbs corrosiveness.

Mail the Metso trademark below, attached to your letterhead for a 16 oz. free sample of Metso.

Philadelphia Quartz Company
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daily clean-up is **easy thorough on schedule**

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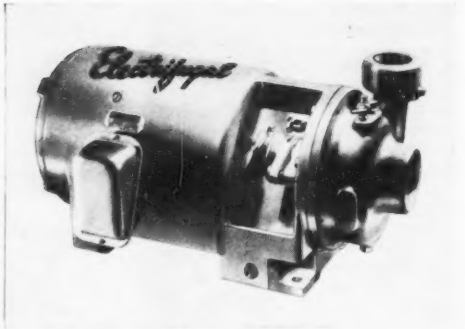


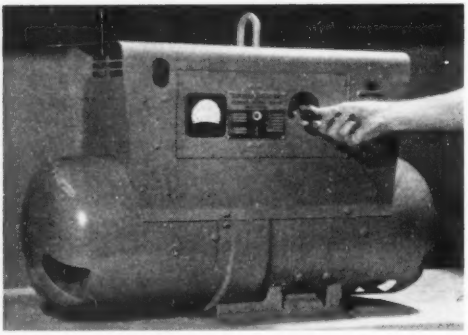
Pump's Redesign Simplifies Maintenance

Internal and external changes in this redesigned close-coupled Electrifugal pump and motor provide better operating characteristics and greater ease in maintenance.

Improved machine has new sealed motor bearings, a unit-cast frame that provides permanent alignment, double seal on front motor bearing that keeps liquid out of bearing under normal operating conditions, and a large opening in the frame between pump and motor to make packing maintenance quick and easy. Its all cast iron construction resists corrosive atmospheres.

Pump is available with removable casing in some sizes and with removable cover plate in others. It can be had in ratings from 10 to 500 gpm. at heads to 220 ft.

Motor, designed and built especially for pump, has a double-dipped and baked stator, a rotor of pressure die-cast aluminum construction, and ventilating fans that move the air from motor rear to pump end. Motors range in size from $\frac{3}{4}$ to 10 hp., and they are available in drip-proof, splash-proof, totally-enclosed fan-cooled or explosion-proof types.—*Allis-Chalmers Mfg. Co., Milwaukee.*



Automatic Features Mark Charger

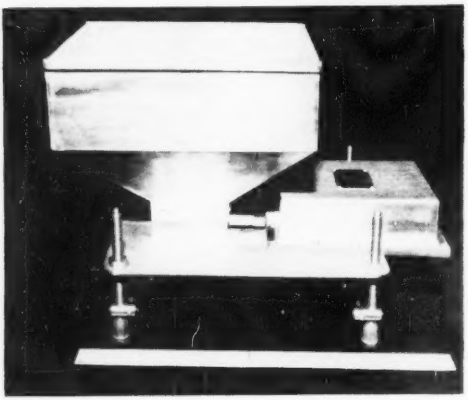
Battery cut-off and charger shut-down when battery is fully charged are automatic in new single-circuit rotating-type battery-charging equipment for electric industrial trucks.

There is also automatic disconnect of the charger from the power line and opening of the charging circuit in case of power interruption. It restarts upon resumption of power service. Control of the charging rate under the modified, constant-voltage charging system is also automatic.

Chargers are protected against generator or motor overload, according to maker's engineers. They are of completely enclosed, dead-front construction and have reverse-current protection and a polarized battery circuit to assure correct connection of battery leads.

Available in two models, the new units are adaptable to, and include all components for, both lead-acid and nickel-iron-alkali batteries.

Both models operate on 220/440v., 3-phase, 60-cycle power supply. They weigh 330 and 390 lb. and measure, respectively, $22\frac{9}{16}$ x 12 x $27\frac{1}{4}$-in. and $23\frac{7}{8}$ x 13 x $32\frac{7}{8}$-in. —*General Electric Co., Schenectady 5, N. Y.*



Dispenser Adjustable for Can Size

In several Northwest canneries, a new stainless-steel salt dispenser is now being used on an experimental basis.

Dispenser fits into production line with the cans filing through underneath the hopper. As each can gets into position, it trips a sensitive lever, setting into action a series of solenoids designed to push-pull a slide bar in the bottom of the hopper. This bar is equipped with different size measuring plugs, enabling the dispenser to deposit the right amount of salt required for each can.

Unit is adjustable, allowing it to handle any size can. Average speed of operation is 150 cans a minute, although dispensers are stated to be shop-tested at 300 rate before being released.—*Henry A. Peterson, Portland, Ore.*

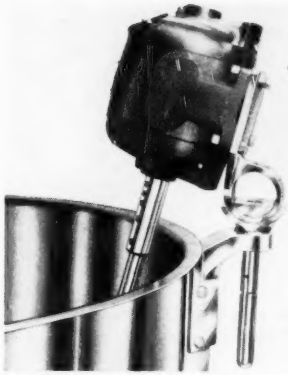
Hot or Cold, New Adhesive Can Take It

For fabricating multiwall and specialty bags from polyethylene-coated kraft stocks, a new adhesive is reported which has resulted in successful packaging for more than a score of products once bothersome or impossible to handle.

Known as "Poly-Lok," it is a ready-to-use, cold "Resyn" seam adhesive that combines high solids with low viscosity. It machines cleanly on direct roller application, tacks immediately at the rate of 100 10-lb. bags per min., and dries to a transparent, light gray film unaffected by variations in temperatures or humidity. There is no-air blistering with age.

Adhesive seams withstand hot calcium oxide at 250 deg. F. and food locker temperatures down to —20 deg. F.

Maker states the new material protects food flavors and keeps hygroscopic products from coalescing, also that it is non-flashing, practically odorless, and contains no fast-evaporating solvents. It may easily be cleaned from glue pots with kerosene, toluene or naphtha.—*National Adhesives, 270 Madison Ave., New York City 16.*



Mixer Positioned Fast With Swivel Bracket

Split-second adjustment to any desired mixing position is reported with this new all-way swivel mixer mounting bracket.

Self-contained hand-bar locking device is designed to fix the mixer in any operating position, quickly and without wrenches.

Unit is available with any type mixer for company's stainless steel open tanks from 5 to 300 gal. capacity.

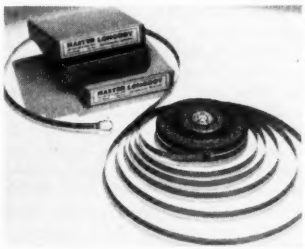
Complete mixing units with new bracket clamp can be supplied with direct drive or slow speed mixers and fitted with differing types and combinations of propellers for specific purposes.—*Alsop Engineering Corp., 500 George St., Milldale, Conn.*

Plywood Freezer Doors For All Applications

Extension of walk-in line of cooler and freezer monopanel-constructed plywood doors to include reach-in, track, double and vestibule models has been announced. This type construction—one piece front and back panels of marine-quality plastic bonded plywood—is said to give great strength and rigidity.

The new track model has been designed for meat packers, to facilitate moving whole sides of beef. Double doors enable large truckloads of food to be transported easily. The swinging doors of the vestibule model automatically close to minimize inrush of warm air.

Reported features of monopanel construction are: Warping eliminated; combination plug and compression-type seal with gasket; two-point fastenings and spring pressure on both hinge and fastener; unbroken insulation; special vapor barrier on insulation; and wear-resistant gasket.—*Jamison Cold Storage Door Co., Hagerstown, Md.*



50-Ft. Steel Tape Rewinds At Press of Button

Food plant men should find many uses for a new 50-ft. steel tape rule that rewinds itself automatically—the first tape of such length to require neither hand rewind-crank nor reel. Called the Longboy, it will soon be joined by a 100-ft. design.

One-man use is practicable. Usual damage to long tape rules caused by allowing them to lie loose in industrial areas is greatly minimized. It takes but 10 sec. to rewind the full 50 ft.

The tape rewinds with a constant retracting torque, no matter whether the full 50 ft. or only the last inch is out. This is made possible by the new Neg'ator-type spring in its planetary coiling mechanism. Thumb pressure on the center plate-button starts rewind. Release of this pressure stops it instantly. Thus tape is under control at all times, and only one hand is required for manipulation.

Case is of formed covered steel. It is sealed against dust and dirt. Tape itself is $\frac{3}{8}$ in. wide and made of high carbon spring steel, nickel-plated for protection against moisture. Graduations are black for easy reading. It weighs 23 oz., and case diameter is 5 in.—*Master Rule Mfg. Co., Middletown, N. Y.*

Manufacturing penicillin is a painstaking job requiring the most accurate controls throughout the entire process. At the Lederle Laboratories Division of American Cyanamid Company, Pearl River, New York, KATHABAR wrings 30 gallons per hour from a 3500 cfm flow of air to deliver a controlled-humidity atmosphere to the penicillin processing rooms. As a slight indication of the control required, KATHABAR delivers air at 9 grains per pound of moisture to maintain a condition in the processing rooms of 16 grains per pound of moisture. If the atmosphere exceeds the vital 16 grains per pound of moisture, the hygroscopic penicillin is quickly damaged. KATHABAR is used extensively throughout the drug manufacturing field for such vital humidity control at economical cost. This is just another example of how KATHABAR can help you solve your production problem.

Write today for the complete story.

The **Kathabar** system of humidity control for industrial processes and comfort offers you:

★ *FLEXIBLE OPERATION*—Prescribed humidity level maintained regardless of outside conditions—humidifies as well as dehumidifies.

★ *DEPENDABILITY*—Few moving parts—system serviced while in operation—non-corrosive solution.

★ *EASE OF INSTALLATION*—Simple duct arrangement—compact and lightweight—minimum assembly required.

★ *ECONOMY*—Extra low operating cost—needs no licensed engineer.

PREVENTS FROST ON LOW TEMPERATURE COILS

Kathabar

MANUFACTURED BY

Surface Combustion
CORPORATION
TOLEDO 1, OHIO

SURFACE COMBUSTION CORPORATION
Kathabar Division
TOLEDO 1, OHIO
Please send Lederle Laboratories story to:
Name _____
Address _____
City _____
Zone _____ State _____

ATTRACTIVE PACKAGES! It's easy to produce neat, eye-appealing packages — so important in product merchandising today — when you use Union Special's *Style 60000D* machine to close small paper bags with the exclusive *"Dubl-Tape"* sewed closure.

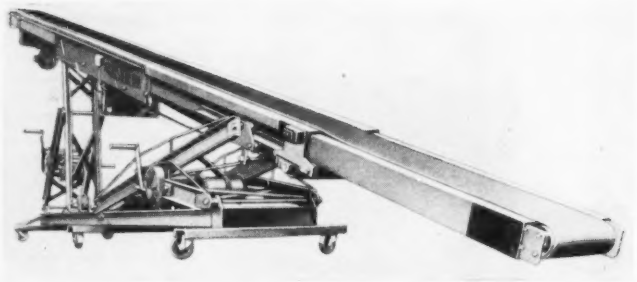
CAPITALIZE ON THESE FEATURES! Machines are especially designed to help you solve your packaging problems:

- **FAST**—keyed to output of standard filling and weighing equipment.
- **VERSATILE**—conveyor adjustable for various bag sizes. Efficient on short or long runs.
- **ECONOMICAL**—requires only a modest investment. Uses inexpensive cotton thread and paper tape.
- **EASY TO OPERATE**—anyone can quickly learn to run machine without previous experience.
- **SEMI-AUTOMATIC OR AUTOMATIC**—for use with one operator or part of a completely automatic installation.

Send for your COPY!

• **BULLETIN ON REQUEST.** Bulletin No. 100 shows how food packers are making profitable use of this machine and how you, too, can use it for closing small paper bags.

Union Special
MACHINE COMPANY
450 N. Franklin St., Chicago 10, Ill.

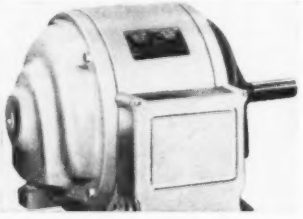


Tricky Handling Problem? Try 'Scope Conveyor

Many materials handling problems may well be solved with this unique telescoping conveyor, named Adjustoveyor. It is easily moved about, and can be extended to almost double its closed length.

Standard lengths of different models are: 8 ft. closed to 14½ ft. open; 10 ft. closed to 18 ft. open; 15 ft. closed to 27 ft. open; 20 ft. closed to 38 ft. open; and 32 ft. closed to 55½ ft. open. All standard belt widths are available and side rails can be added where necessary. The conveyor is able to carry full loads over its entire length, even when fully extended. Slide-type will carry a total distributed load of 850 lb., and a unit load of 150 lb. before slippage. Roller-types will carry proportionately heavier loads.

Typical uses for telescoping conveyors are seen for elevating between floors, stacking in high places, carrying loads into trailer bodies, and transporting over aisleways.—*Stewart-Glapat Corp., Zanesville, Ohio.*



Drip-Proof Motors Mount Three Ways

Single-phase capacitor-type drip-proof motors have been added to the "Klosd" line.

These motors may be sidewall-, inverted ceiling-, or floor-mounted and still retain the drip-proof feature by simply rotating the end bells so that the air vent openings point downward.

Motors have a newly designed starting relay that eliminates the necessity of centrifugal switches or any rotating devices such as throw-out switches, commutators, or brushes. One-piece cast iron stator frame is employed, and included in design are "Herringbone" rotor, prelubricated ball bearings, and Vinol-acetal-insulated wire stator windings.—*Sterling Electric Motors, Inc., Los Angeles.*

Accurate Metering Of Clear Liquids

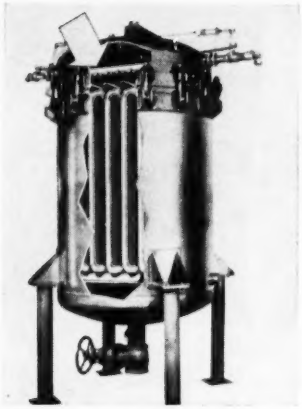
Using the "MiniPump", it is reported that clear liquid can be pump-metered with exactness at rates anywhere from as low as 3 cc.'s per hour at minimum stroke length to 800 cc.'s per hour at full stroke length.

Typical laboratory uses include automatic titration, proportional blending of two or more liquid streams, and continuous sampling. Production-line uses are injecting odorants into gases, handling inhibitor compounds, adding vitamins to food products, or other jobs calling for precise metering of clear liquids in small volumes.

Unit is a positive displacement type metering pump with a reciprocating plunger ⅛ in. in dia. The cam, driven by a fractional gear-head motor, actuates the spring-loaded cam follower attached to the plunger. Limiting the travel of the plunger with a simple graduated screw adjustment decreases the displacement, thus lowering the volume delivered.

The liquid end is of double-ball check design. That end and the plunger are Carpenter 20 stainless steel construction, with the former treated to improve corrosion resistance. Ball checks of 3/16 in. dia., are available in precision 440 stainless, glass, or synthetic sapphire balls to meet various demands for corrosion resistance.

Ball bearings are oil impregnated and self-lubricating. Should passages become clogged or dirty, clean-out plugs are provided at 3 points in the liquid end to permit cleaning internally with ordinary pipe cleaners.—*Milton Roy Co., 1300 E. Mermaid Lane, Phila.*



Automatic Self-Sluicing With Redesigned Filter

Less maintenance, simplified operation and easy conversion to automatic self-sluicing are reported results of four design improvements in the Auto-Sluice pressure leaf filter.

The filter cover has been modified so it can replace standard non-sluicing covers on older models. Air motors that operate sluicing sprays have been redesigned so they require less maintenance. Simplified linkage between air motor piston and spray header contains fewer moving parts. And a new stuffing box permits leakage-free filtration of corrosive and sticky liquids under pressure differentials as high as 65 psi.

The new cover consists of a header into which high-pressure spray nozzles are fitted. These are positioned so that sprays of sluicing liquid strike the cake of each leaf. Air motors impart both rotary and reciprocating motion, aiding cleaning. Simple adjustments provide speed regulation.

Maker states that performance records show filter cakes up to 35 cu. ft. can be removed in as little as 15 min., using only 70 to 100 cu. ft. of water. This decreased down-time between cycles raises total productive filtration time accordingly.

Cake does not have to be handled. With suitable piping it can be discharged under pressure, in a largely repulped condition, direct to waste or for further processing.

Filters are available in sizes from 120 to 750 sq. ft. of filter area, in a variety of materials.—*Niagara Filter Corp., 3080 Main St., Buffalo 14, N. Y.*

For Reading Duct Sizes

The Ductulator is a multiple-scaled circular slide rule for shortcutting duct sizing problems. For example, knowing air volume and velocity, engineer can find friction loss per 100 ft., and dimensions of duct (either round or rectangular) to carry the load—all with one setting. Engineer sets any known factor to coincide with cfm., then all other factors may be read with single setting.—*The Trane Co., La Crosse, Wis.*

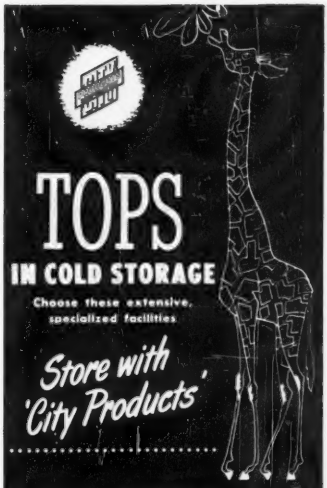
Steel Enclosed Breakers Individually Mounted

Low voltage air circuit breakers, Types G-25 and G-50, previously available only as bare breakers or in metal-enclosed switchgear, can now be had for individual mounting.

The individual, stationary mounted unit has a sheet steel enclosure formed and welded into a housing that completely encloses the circuit breaker and cable connections. Front portion of the enclosure is provided with an easily removeable hinged panel, ventilating louvers, latching mechanism and door handle, hasp for locking, and necessary flash barriers.

Rear portion or cable entrance box can be separated from the breaker housing. It includes removable cover plates at top, bottom and sides for easy connection, and cover plates with 3—, 3⅝—, 4⅛—, and 4⅝— in. dia. knockouts for incoming and outgoing cables. Weather-proof units are completely rubber gasketed, and lifting lugs are provided for easy handling.

Particularly effective where frequent operation is expected, the breakers are suitable for protection of lighting loads and small transformers, across-the-line starters, as back-up protection for motor starters, and as main feeder breakers on systems which have a.c. voltages of 600 and below, fault currents of 25,000 and 50,000 amp., and continuous currents from 35 to 1,600 amp.—*Allis Chalmers Mfg. Co., S. 70th St., Milwaukee, Wis.*



15 NATIONWIDE COLD STORAGE WAREHOUSES

Seaboard Terminal & Refrigeration Co.
Jersey City, N. J.

City Products Corporation
Hornell, N. Y.

Federal Cold Storage Co.
Pittsburgh, Pa.

Federal Cold Storage Co.
Cleveland, Ohio

Federal Cold Storage Co.
Columbus, Ohio

Polar Service Company
Decatur, Ill.

North American Cold Storage
National Stock Yards, Ill.

Federal Cold Storage Co.
St. Louis, Mo.

Mound City Ice & Cold Storage Co.
St. Louis, Mo.

Springfield Ice & Refrigerating Co.
Springfield, Mo.

Frank Pilley & Sons, Inc.
Sioux City, Ia.

Federal Cold Storage Co.
Kansas City, Kans.

Tulsa Cold Storage Co.
Tulsa, Okla.

Galveston Ice & Cold Storage Co.
Galveston, Tex.

Crystal Ice & Cold Storage Co.
Phoenix, Ariz.

CITY PRODUCTS CORPORATION
COLD STORAGE DIVISION
33 S. CLARK ST., CHICAGO 3, ILL.

SELLS on SIGHT

when the wrap is right!

"LOOKS" mean a lot to a woman—and this applies to practically everything she buys—food as well as personal items.

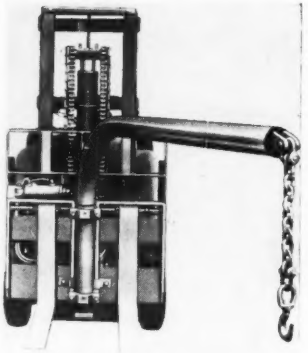
Smart packers realize this, and take great pains to obtain the very best type of wrap for their frozen foods. Colorful wraps that show the product in realistic, appetizing form step up sales immensely. Equally important is the way the wrap is applied—and here is where our Model FF machine plays a big part. For this modern, specially designed wrapper produces a tightly sealed, perfectly registered wrap at speeds of up to 100 per minute, and it makes no difference whether the packages are wrapped before or after freezing. End seals are firm and neat, even over the recessed ends of fibre cans. Printed designs are located correctly. No slipshod duds to spoil the looks of the product and ditch the sale!

Give your package a SALES PLUS
by wrapping it on the FF.

Write us for further information

PACKAGE MACHINERY COMPANY
SPRINGFIELD, MASSACHUSETTS

NEW YORK CHICAGO BOSTON CLEVELAND ATLANTA DALLAS
DENVER LOS ANGELES SAN FRANCISCO SEATTLE TORONTO MEXICO, D.F.



It's a Slewing Crane Arm

Rapid, easy positioning of freight car loads up to 800 lb. at 80-in. load center is aim of latest specialized materials handling device—the slewing crane arm. Two-way hydraulic conveyor can swing arm laterally 20 deg. to either side. It's detachable for use with standard pallet forks.—*Toumotor Corp., 1226 East 152 Street, Cleveland 10, Ohio*

Equipment Briefs

Truck Service by Phone

With "Operator 25" now in action on the phone lines, drivers on the highway can quickly locate the nearest GMC-approved service by making only one telephone call. This new system of finding service facilities the easy way in any part of nation is a phone call to the nearest Western Union office. WU's "Operator 25" then tells driver the locations of approved dealers' service points for both Diesel and gasoline-powered trucks and truck-tractors. Motor company will pay cost of system.—*GMC Truck & Coach Div., General Motors Corp., Pontiac, Mich.*

Protects Surgical Dressings

To provide adequate care and protection for injured workers and to keep them on the job if at all possible—that's the purpose of a new thin, pliable plastic bandaging tape called "Easitape". It is not sticky, leaves no residue or stains, and completely protects bandaged dressings from oil, water, dirt, and other foreign matter. Tape is coated on both sides with compounded Hycar latex, the base material, manufactured by B. F. Goodrich Chemical Co. Coating enables tape to seal quickly and remain sealed.—*Brasel Products, Inc., Batavia, Ill*

New Plasticizer for Vinyl Plastics

Based on results of toxicity tests carried out by maker, "Flexol" plasticizer DOP is reported to have been found suitable for use in vinyl plastics that come in contact with foods. Manufacturer recommends its trial in these applications: Film wraps for prepackaged lamb and beef, vegetables, cheese, and frozen foods; milk and beer tubing; coatings for food conveyor belts; and adhesives for food packages. —*Carbide & Carbon Chemicals Div., Union Carbide & Carbon Corp., 30 East 42nd. St., New York City 17.* —*End*

the 2nd big reason why

Dowfume EB-15

is "Tops" for food machinery and spot fumigation

1. **Highly effective against all common pests of food processing establishments.**
2. **Low volatility.**
3. **Nonflammable.**
4. **Has a warning odor as a safety factor.**
5. **Economical.**
6. **Time-saving—easy to apply without special equipment.**
7. **Residual effect delays reinfestation of stock.**

Here are 7 of the many reasons why Dowfume EB-15 is ideal for use in food plants. Besides those listed, you'll discover other worthwhile advantages of this outstanding fumigant material.

Dowfume EB-15 is slow-evaporating because of its low volatility. This enables it to remain effective for as long as 30 days after application, particularly when applied on dead stock.

Treatments are suggested at monthly intervals or as needed. It is important to use spot fumigation during intervals between general space fumigation with Dow Methyl Bromide. Any machines handling products susceptible to infestation and which are apt to have dead stock accumulations in corners, cracks and crevices should be treated with Dowfume EB-15. Machines should be reasonably tight in order to retain the fumigant vapors for a sufficient length of time to kill pests.

The Dow Chemical Company has a long history as one of the leading producers of fumigant materials. Each of these products is thoroughly tested under many conditions to give you best results. For more information—or for the name of your local fumigation service handling these time-tested fumigants—write our Fumigant Division.

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When you use fumigants . . . insist upon
DOW DIAMOND QUALITY

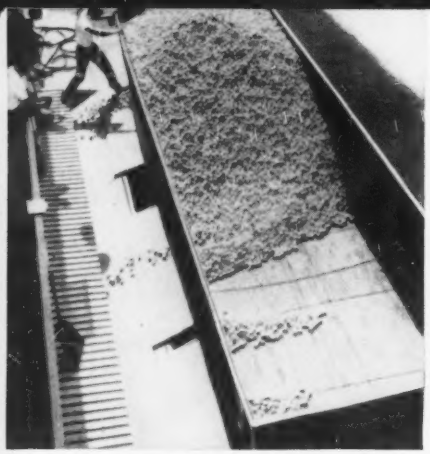
Dow Methyl Bromide • Dowfume EB-15
Dowfume EB-5 • Dowfume MC-2
Dowfume 75 • Picride

DOW

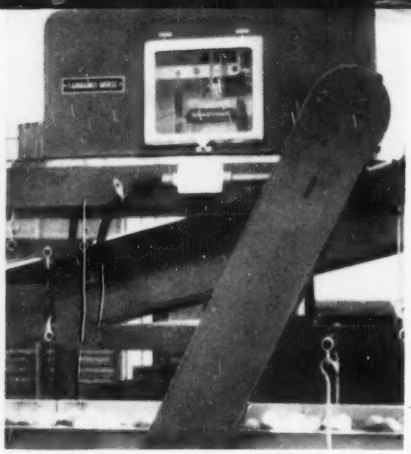
CHEMICALS

INDISPENSABLE TO INDUSTRY AND AGRICULTURE

TURN PAGE FOR FOLDOUT FLOWSHEET →



1 **TRUCKS** unload fruit from side ports onto pre-inspection belt.



2 **RECORDING SCALE** weighs fruit conveyed from adjacent Eadington Fruit Co.

UNFOLD HERE

How Latest Citrus Juice Lines Operate

Astute Engineering Has Streamlined Them for New Efficiency

FOUR MONTHS—that was the striking time record set in building and equipping the $1,000,000 plant of Golden Citrus Juices, Inc., at Fullerton, Calif.

The plant was designed primarily to produce concentrated frozen orange juice. It is also equipped to make pasteurized single-strength and pasteurized concentrate.

Fruit arriving by truck from packing sheds—Point (1) in diagram—has already had initial grading for size and quality. It is now finally graded as it moves over the system of conveyors and rollers to the storage bins.

Meanwhile, there are conveyed from the associated Eadington Fruit Co., nearby, special lots of oranges specifically graded for this plant. As they move to the storage bins they are weighed on a continuous scale—Point (2). Representative samples are automatically taken from both sources and tested for Brix, acid, and juice yield.

Moving from storage bins into process, fruit is inspected, soaked in a detergent bath, sprayed with chlorine water, and mechanically scrubbed under sprays of detergent and chlorine water. After final inspection, oranges are again sprayed with chlorine water, graded for size and then go to the extractors—Point (3). Fruit, not accepted by the extractors, is automatically returned to the size grader.

Pulp, fiber and seeds are removed in a coarse finisher before the juice is collected in the cold-wall storage tanks, where it is tested and sugar added if needed.

In the manufacture of frozen concentrate, 85 percent of freshly extracted juice is put through a fine finisher. Then it is concentrated to 58 Brix and automatically blended with the remaining juice to produce a 42 Brix product. Concentration is carried out in a two-effect evaporator at temperatures ranging from 50 to 75 deg. F. (Provision has been made for addition of a 3rd effect).

Filled Into Cans Then Frozen

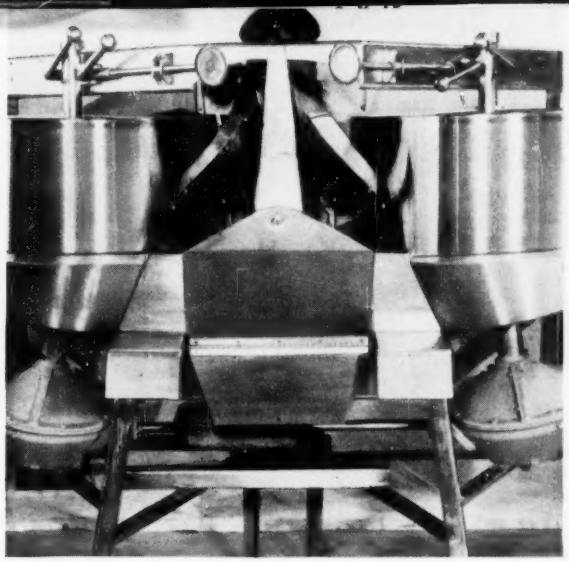
After blending, the juice is chilled to 25 F. then filled into 6-oz. cans and sealed. Filled cans are frozen by conveying through a refrigerating medium (isopropyl alcohol) at —30 F. As cans emerge from the freezer, their surfaces are brushed free of residual refrigerant—Point (7). Lithographed cans go on Line No. 1 (diagram) directly to the dryer, thence to the caser, case-gluer, and compression unit, and frozen storage. Bright cans, from Line No. 2, roll down an inclined, steam-jacketed conveyor, where the surfaces are heated to make labeling possible, then are labeled, packaged, and conveyed to storage.

Two types of unfrozen juices are produced—concentrate, and single-strength. In production of the former, fresh juice is concentrated to the desired Brix (42-65) and pumped, at 600 psi., through two of the pasteurizing units —Point (5). In the lower unit the juice is sterilized at 200-240 F., then water-cooled, in the upper unit, to about 190 F., at which temperature it is canned. Filled cans are cooled in 35 F. water, then labeled and cased.

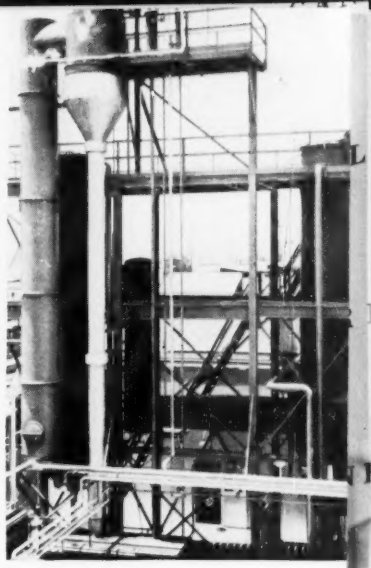
In the production of pasteurized single-strength juice, the fresh sweetened product is pumped through the final effect of the evaporator, where it is deaerated under a vacuum of 29.6 in. Hg, through the pasteurizers where it is sterilized at 210 F. and cooled to about 190 F. Juice is immediately canned, cooled as in the concentrated pasteurized product, then labeled and cased.

Double Job—*Plus*

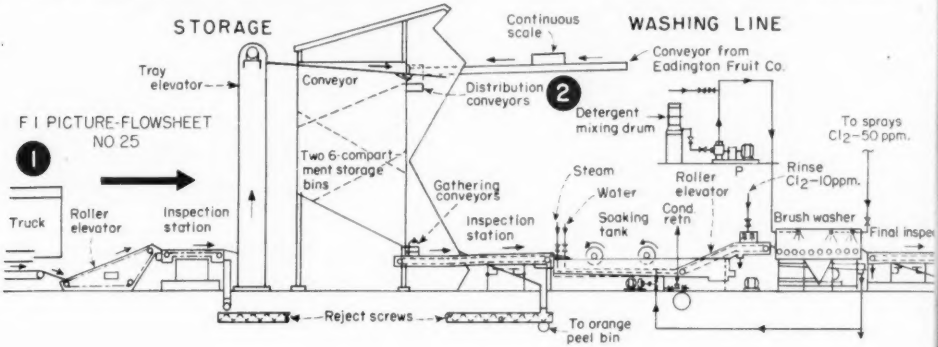
To erect a brand new plant from scratch is a full size job. To fit it out ready to run is twice the job. And to go still further and make the plant tops in its field is even tougher than that. Golden Citrus, whose processing lines are diagrammed here, did all three—and in the amazing time of only four months. For the story telling how, turn to this month's Special FI Report on p. 67.

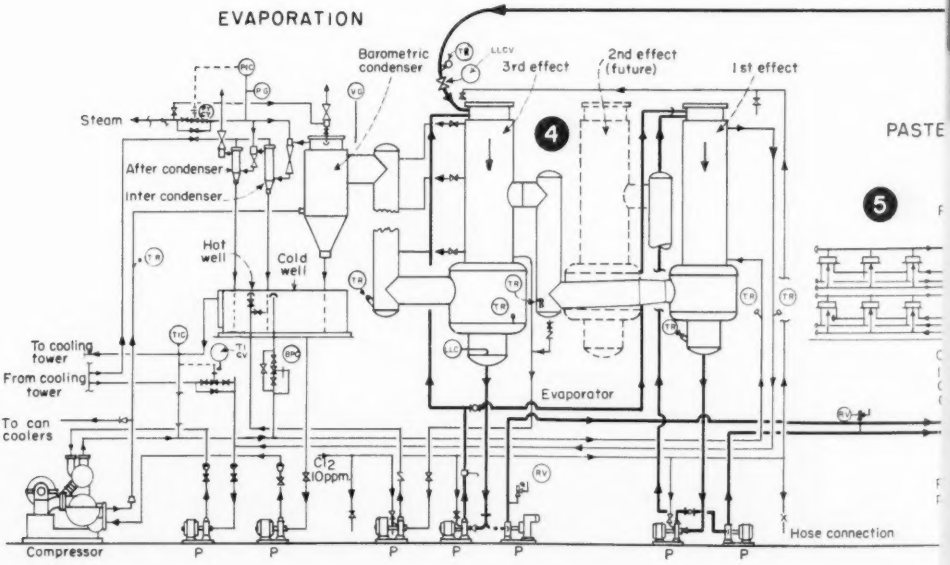


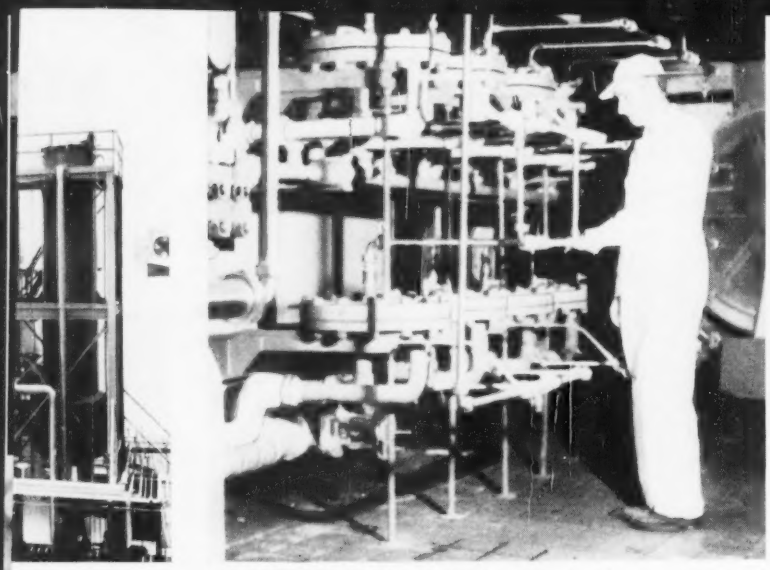
3 **EXTRACTORS** cut oranges in half, then halves are held in rubber cups as reamers remove juice.



4 **DOUBLE-EFFECT** evaporator has ca 7,000 lb. per hr. There's space for 3

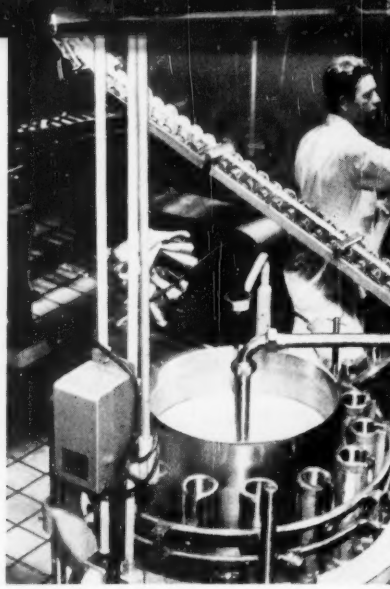






r has capacity of
pace for 3rd effect.

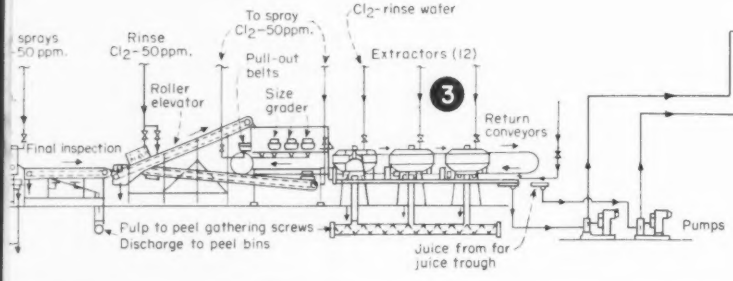
5 **PASTEURIZERS** for single-strength and unfrozen concentrated juice. There are twelve 25-ft-long units arranged in two banks.

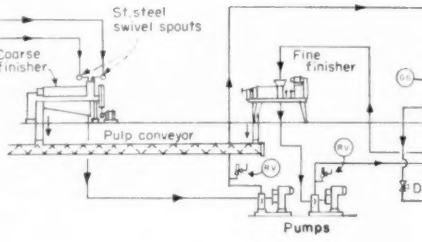


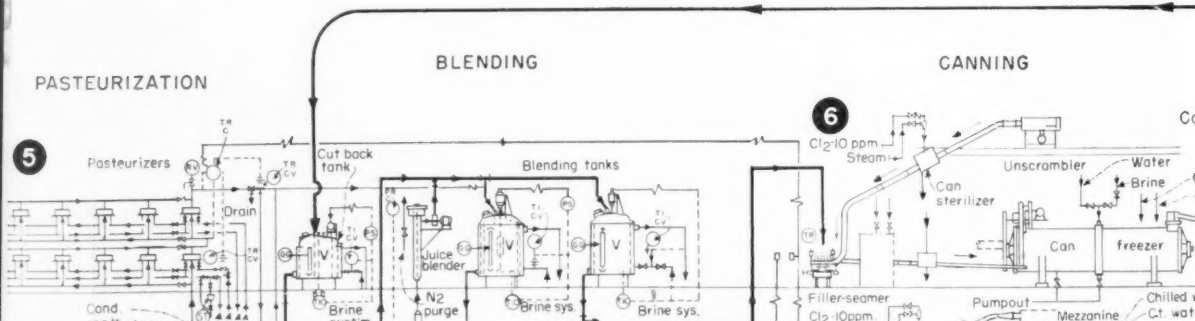
6 **FILLING.** Cans, fed from mezzanine, pass
are filled with precooled juice. Head space is

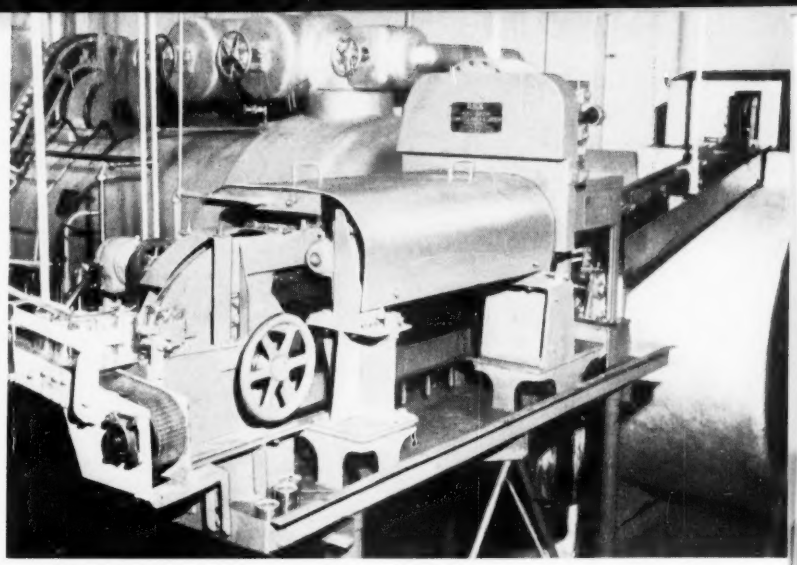
JUICE EXTRACTION

JUICE FINISHING



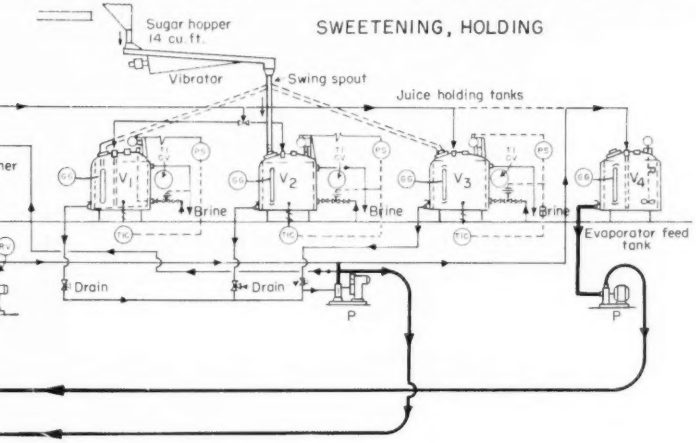


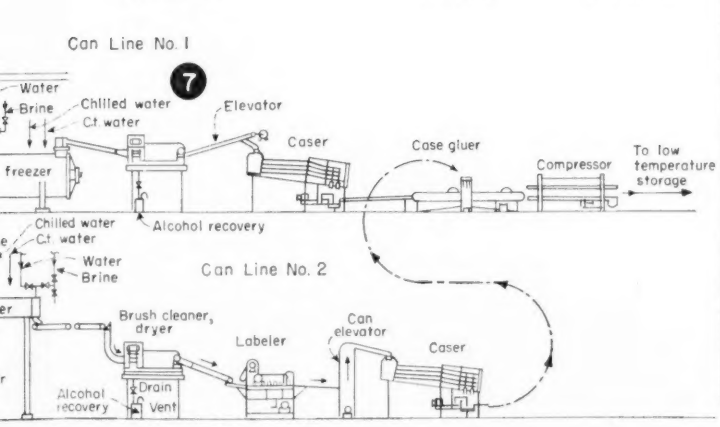




hine, pass through steam sterilizer, then
ad space is exhausted and lids seamed on.

7 **CLEANER-DRYER** brushes cans to remove refrigerant carried over from freezer (right rear). Alcohol, caught in pan under brush, flows to recovery unit.





LEGEND AND NOMENCLATURE

ABBREVIATIONS FOR INSTRUMENTS & CONTROLS

TIC --- Temperature indicating controller

TICV -- Temperature indicating controller motor valve

TR---- Temperature recorder

TRC--- Temperature recording controller

TRCV -- Temperature recording controller motor valve

PIC --- Pressure indicating controller

PICV -- Pressure indicating controller motor valve

PRC--- Pressure recording controller

PRCV -- Pressure recording controller motor valve

BPC --- Back pressure controller

PS --- Pressure switch

PG --- Pressure gage

LLC--- Level controller

LLCV -- Level controller motor valve

LFV--- Level float valve

GG---- Gage glass

VG---- Vacuum gage

ST---- Steam trap

ABBREVIATIONS FOR PROCESSING EQUIPMENT

P----- Pump

V----- Vessel, tank

C----- Compressor, booster

E----- Evaporator, Heat exchanger

RICHARDSON PROPORTIONING EQUIPMENT WORKS FOR D. A. STICKELL & SONS

PROBLEM

To develop a pre-weighing batching method that would insure consistently accurate proportioning and blending of standard formula feeds and pelleted rations for the D. A. Stickell & Sons Feed Milling Plant at Hagerstown, Md.

SOLUTION

Installation of a Richardson proportioning system consisting of 14 scales for 14 different ingredients, bagging scales for the end product and a master control panel to control the scales as well as existing mixers and conveyors. The scales and the control system were entirely engineered and built by Richardson. *Result:* Labor-consuming "hand" proportioning eliminated, machine-made accuracy in every batch—A UNIFORM END PRODUCT—ALWAYS.

Until recently, batching systems were almost unknown in the feed industry. That is, until D. A. Stickell and Sons reasoned that it made no difference whether a Richardson Automatic Scale delivered to a bag or a mixer. Its ¼ of 1% accuracy and long-term dependability certainly would pay off here too. So . . . Richardson was asked to develop a feeder-weigher-conveyor system to insure accurate proportioning, keep waste at the absolute minimum and produce feeds and pelleted rations of uniform content and consistent quality.

Developing and installing systems of this type throughout the process industries is Richardson's specialty. Through fifty years of manufacturing materials-handling-by-weight equipment, Richardson has built up a tremendous backlog of practical experience. An experience with such diverse materials as glass, rubber, alcohol, flour, cement etc. enables Richardson Engineers to recommend the best system or combination of systems that will prove most effective in solving your particular problem. Their suggestions will prove valuable to you . . . will point the way to more profitable operation and readier sales, without need for heavy capital investment. To ask them to survey your feeding-weighing-conveying methods places you under no obligation and it may be the starting point for better business for you.

Richardson Scale Co., Clifton, New Jersey. Feeder—Weigher Systems of All Types: Automatic Bulk Weighing Hopper Scales, Including Conveyor-Feed Types—Continuous Feeder-Weighers—Automatic Bagging Scales—Bag-Sewing Conveyors—Packers—Process Control Panels. *Branch offices in:* Atlanta • Boston • Detroit • Minneapolis • Cincinnati • Wichita Montreal • Omaha • New York • Pittsburgh • San Francisco • Toronto • Buffalo • Chicago Philadelphia • and Houston.

6620

Richardson

MATERIALS HANDLING BY WEIGHT

Longer service life at lower final cost

with dependable

CRANE VALVES

No. 1610 Diaphragm Valve. Ask for literature on full line through your Crane Branch or Crane Wholesaler.

CASE HISTORY FROM CRANE FILES

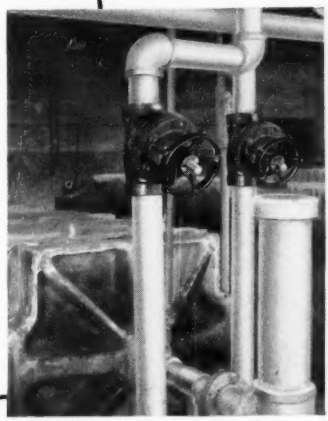
PROBLEM: To find a more efficient and economical replacement for plug cocks having an average life of only 2 to 8 weeks in pipe lines handling liquid clay to filter presses.

WORKING CONDITIONS: Working pressure 140 psi, with liquid clay flow creating highly erosive effect; also corrosive. Strong tendency to clogging. Operating cycles 5 to 6 per day; relatively quick opening and closing required.

SOLUTION: Crane No. 1610 Diaphragm Valves, iron body, packless design, with separate disc and diaphragm.

RESULT: After 11 months' uninterrupted service, Crane valves showed no significant wear or damage resulting from normal operating conditions. User assured of greatly reduced maintenance and replacement costs over plug cocks. No. 1610 Diaphragm valves approved for standardization on all filter press piping.

Another example of the greater value in Crane Quality, and the lower final cost of Crane Valves for every service. That's why . . .
More CRANE VALVES are used than any other make!



The installation—Onondaga Pottery Co., Syracuse

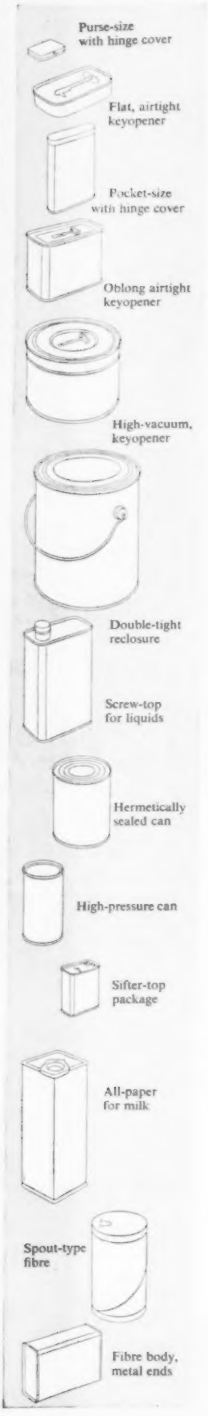
CRANE

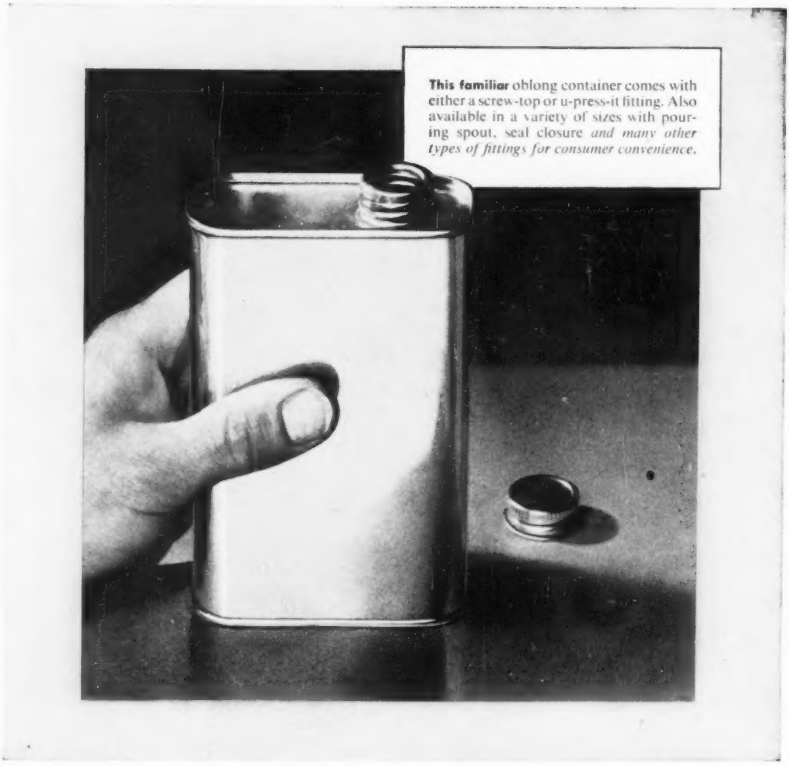
CRANE CO., *General Offices:* 836 S. Michigan Ave., Chicago 5, Ill.

Branches and Wholesalers Serving All Industrial Areas

VALVES • FITTINGS • PIPE • PLUMBING • HEATING

WHICH PACKAGE SUITS YOUR PRODUCT?





This familiar oblong container comes with either a screw-top or u-press-it fitting. Also available in a variety of sizes with pouring spout, seal closure *and many other types of fittings for consumer convenience.*

Are you considering the consumer when you package liquids?

This container makes friends—keeps 'em!

You know it as the handy can that pours easy, doesn't drip and closes tight.

Advertising experts and sales managers know it as the package that "works with" the label—plenty of space to show your brand in brilliant color.

It now helps sell such products as linseed oil, turpentine, paint and varnish remover, maple syrup, honey.

It could easily do the same robust selling job for liquid detergents, liquid wax or olive oil.

Brass? Silver?

And how about brass or silver polish, glass cleaners?

To sum up, *this container is ideal for many liquids where positive reclosure is essential.*

Don't you think your package-development experts should get together with ours?

Since 1901 Canco has been responsible for just about every important development in the packaging industry—food and non-food products alike—involving an infinite variety of containers that are metal, fibre or a combination of both.

Let Canco help *you* in designing labels, cutting costs, building sales and advising on packaging, processing, filling and closing.

For prompt help in production-line emergencies, and containers in any quantity when you need them, take our advice and *call Canco first!*

AMERICAN CAN CO.

CANCO

NEW YORK
CHICAGO
SAN FRANCISCO
HAMILTON, CANADA

TERS

CES • CANNED SOUPS • POR

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MEAT PRODUCTS • SPAGHETTI • S

• CATSUP • WIENI

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Taste Sells...

Since 1904

STANGE CREAM OF SPICE SEASONINGS

Silent Partners in Famous Foods

WM. J. STANGE CO. . . . CHICAGO 12, ILL. . . . OAKLAND 6, CAL.
(RHYMES WITH TANGY)

Teletype Number Chicago: CG 418—Oakland: OA 174

Some things give solid satisfaction

You've waited for this—the day you and your son would reach across the years and share a boy's pleasures together! Something of the same satisfaction is yours when the success of your product justifies all the effort you've put into it.

Of course, you've used sugar. To quality manufacturing, sugar brings a uniformly high standard of purity. Sugar has 10 to 50% more sweetening power. Sugar alone brings out the best natural flavors of higher-priced ingredients.

Set your signals for a clear track —always use sugar. It pays off in solid satisfaction.

SUGAR
INFORMATION INC.
NEW YORK 5 NEW YORK

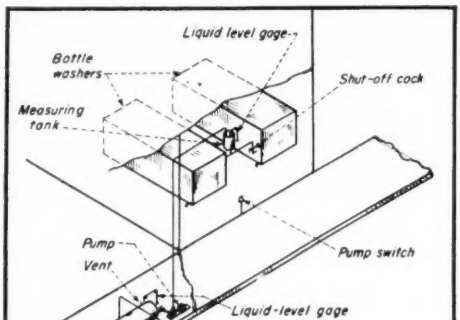
PRACTICAL IDEAS

Lets Light In, Keeps Heat Out

Much more than illumination is provided by the large continuous windows around both floors of the modern building that houses the offices and processing operations of Juice Industries at Dunedin, Fla.

For these windows also make the building a pleasant place to work, despite the hot Florida sun.

Special actinic glass does it. Panes of this type readily transmit all cool light rays—but they keep out the heat rays and also the ultraviolet rays.



Liquid Caustic System Does It Better

Faster, safer, and more economical handling of a dangerous cleaning agent has been accomplished by changing over from flake to liquid caustic soda use in a dairy plant.

I was called upon to design a system for using liquid caustic in our bottle washers. Looking over the situation, I saw that the flake caustic was supplied in 500 lb. steel drums. Brought in by truck, they were stored on one of the upper floors, requiring the use of an elevator plus the handling.

Fifty drums were bought at a time. And a man had to be assigned to haul down one drum a day for use—again employing the elevator. He cut the top off the drum with a hammer and chisel, then moved the flake caustic pail by pail, over conveyors to a mixing tank. Here, a weak caustic was let in to dissolve the flakes, with additional steam also used. And the caustic was then pumped back into the caustic tanks of the washers.

The whole time-consuming job was a back-strainer, and there was always danger when opening the drums. Also, when washers were cleaned out thoroughly every few months, it took four to five drums to refill the charge.

The sketch above shows my new system, connected to two washers. A 2,000-gal. iron tank was fabricated on the job and installed on concrete piers. A filling pipe was led to the curb of the street above and to a fill box and cap similar to those used for oil burner installations. Liquid caustic is delivered in 1,000-gal. tank trucks.

A small steam coil was installed in the tank, because liquid caustic tends to solidify below 50 deg. F. The reason for employing a 2,000-gal.capacity tank was to give some leeway for delivery. When the amount remaining in the tank drops to 500 gal., or so, there is enough room for another 1,000 gal. load.

A steel ball float and chain with a weighted marker on the outside of the tank indicates the amount inside.

Caustic, from the storage tank, is lifted to an upper measuring tank by a small electric-driven all-iron pump and impeller. A float indicator shows the amount pumped into this tank, which is suspended from the ceiling of the washer room. From the tank bottom a drain pipe leads to the caustic tank of each washer, where there is an iron shut-off cock (see sketch).

The measuring tank has a capacity of 40 gal. The starting switch for the pump is located on the washer-room wall, where the operator can see the float-operated marker. Type of switch used requires the operator to hold his finger on the button to keep the pump running—no chance of starting the pump and letting it run.

Since consumption is about 30 gal. per day for each washer, the operator can add this amount each day before operations. Strength of the caustic solution in the washer is checked by the laboratory man.

All the operator has to do is see that the cocks are closed at the washers. Then he starts the pump (of 30

$50 EXTRA FOR BEST ITEM

You are invited to submit Practical Ideas. You will be paid at regular rates when your item is printed and if it is judged best for the month you will get an additional payment of $50.

Selection of the best contributed item will be made by a group of 200 readers each month, and the item title and author's name will be cited (see below).

Practical Ideas may describe any type of device or method recently developed to solve a problem, speed an operation, or make some task easier. They may concern factory, laboratory, warehouse, or power-plant operations in the food industry. Ideas on management, maintenance, and trucking or shipping also are suitable.

You need not be an experienced writer or draftsman to submit these ideas. The text will be edited and sketches converted to finished drawings.

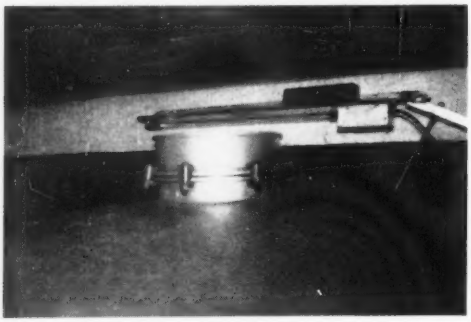
Send your items to: Practical Ideas Editor, FOOD INDUSTRIES, 330 W. 42nd St., New York 18, N. Y.

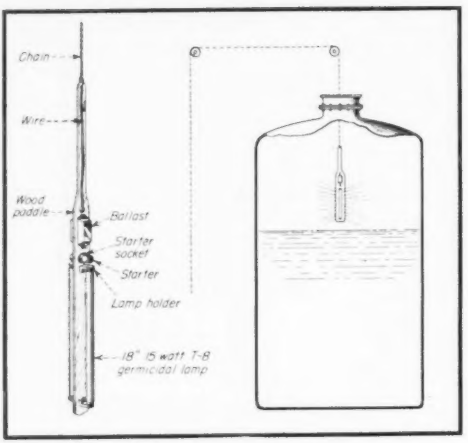
NOVEMBER PRACTICAL IDEA voted best was "Distribution System Pays Off." Submitted by Robert A. Latimer, Denver, it described the cabinet method employed by Miller Supermarkets to distribute baked goods.

gpm. capacity), watches the marker on the measuring tank, and in a minute there are 30 gal. in the tank. He then stops the pump and opens the cock on one washer to let the caustic flow into it. He repeats for the other washer.

The measuring tank is provided with a cover and vent. Piping is pitched back to the pump. No check valve was put on the discharge of the pump, hence any caustic remaining in the line flows back to the lower tank. Piping is all iron and welded.

The dairy workers all hope that there never will be a need to return to flake use.—*George Griffel, Professional Engineer, New York City.*





Three New Twists With Ray Lamps

At our winery—Widmer's Wine Cellars, Inc., Naples, N. Y.,—three special rig-ups of germicidal lamps have brought significant gains in retaining product quality in storage.

Here there were installed vertical Pfaudler steel glass-lined tanks, averaging about 13,000 gal. capacity per unit. There is an 18-in. opening in the center of the top of each of the tanks.

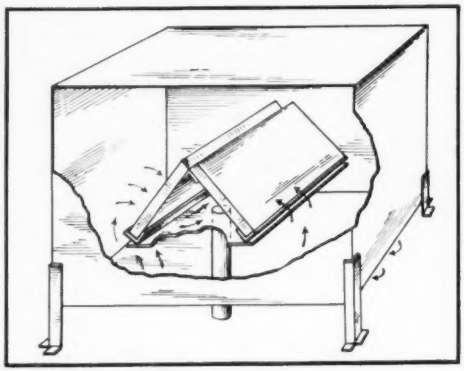
Refrigerated rooms, housing the tanks, are maintained at a uniform temperature at which the juice will not ferment or mold. A constant flow of refrigerated air is employed. This controlled temperature varies with the sugar content of the juice.

Mold and yeast have a tendency to acclimate themselves to low temperature. Thus they again may become active unless precautions are taken other than refrigeration. Ever since installation of tubes of the slim line type directly over the 18-in. openings on the tops of the tanks (see photo), the juice has not changed. And there has been no trace of mold or yeast action.

To further shield the juice, a second rig-up was made (see sketch above) which provides additional protection as the tanks are being emptied. Two 15w. germicidal units, mounted on a wooden paddle suspended on a chain, are lowered inside the tank. This procedure permits the light rays to come in contact with the entire surface of the juice and the exposed portion of the tank.

Still another procedure has been developed which employs the lamps just prior to filling of juice in the tanks in the pressing season. At this time, all tanks are first thoroughly cleaned, then the lamps are used as a further means of sterilizing the interiors.

Each tank is equipped with a 15-in. manhole door in the side, about 5 ft. from the bottom. Two 15w. germicidal tubes, set back to back, are inserted through each of these tanks doors and kept inside for a 3 hr. period to assure sterilization. Assistance was given on work by G. E., Nela Park, Cleveland.—*William Widmer, Naples, N. Y.*



Roof Filter Protects Air Machines

Improved air machine operation can be gained through the use of this readily made, inexpensive filter. The assembly is placed on the building roof and hooked up to the air machine intake.

There are frequent uses for air from a compressor or blower in a plant. But with dust present—whether an explosion hazard or not—it is unwise to pass such laden air through compressors or blowers.

Where dust is excessive, conventional air-cleaners tend to clog. It's a help to run a pipe to outside air, but around a dusty plant this air, too, contains excessive dirt. So the trick is to install a filter assembly—simply made like this:

Just purchase dust filters (using glass wool or other air filtering material) and place two of them at right angles (see drawing) in a form made by welding angle irons to a sheet of metal.

Strips of felt should be placed on the surfaces of the angle iron before the filters are located, also between the two filter edges at the top. A section of angle iron, the length of the filter, placed V down at the junction of the filter edges at the top, will hold the top felt firmly against leakage.

A hole is cut in the bottom plate to fit the suction pipe of the air machine. The assembly, is welded onto the section of the pipe, which should extend a foot or two through the roof. The pipe serves as support for the unit. To protect

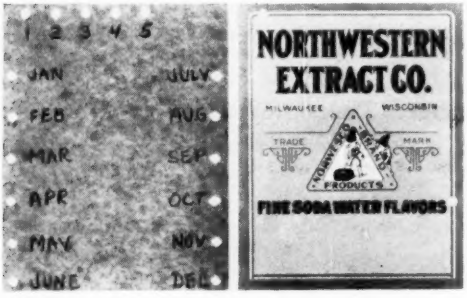
the assembly from the weather, a metal box on legs is placed over it. The box should be large enough to permit free passage of air to the filters. Sides of the box extend 6- to 8-in. below the bottom of the filter to protect it from rain and snow.—*W. A. Reed, Plant Engineer, Taylor Reed Co., Glenbrook, Conn.*

Fans Keep Flies Out

At Fuchs Baking Co., South Miami, Fla., cases of baked goods are carried to delivery trucks by a double-deck conveyor. And the same conveyor brings empties from the trucks to the packaging department.

But there was the sanitary problem of keeping flies from entering the plant. For transfer of full and empty cases onto and off the conveyor requires that doors along the truck loading area be open.

The difficulty has now been solved by the simple expedient of mounting two fans above each door in such a position that their air streams are directed downward in front of the door. This movement of air acts as an "unseen screen," since it causes the flies to turn away.



Simple Template for Effective Coding

Two easy methods of code dating labels, each involving a template, have proven highly effective in control work at companies where I have been associated.

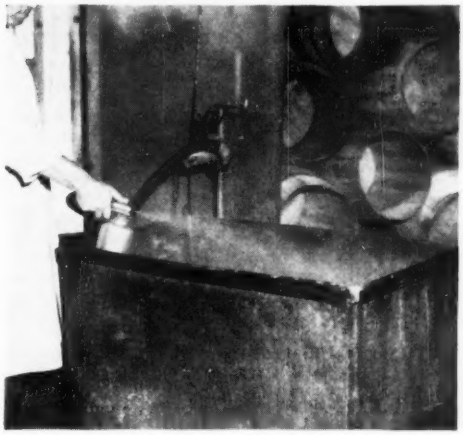
In the first instance, a template the size of our labels was made out of thin fiber board. Notches were cut at different points along the edges to indicate the months, weeks and years. This template was then placed on the package of labels and corresponding notches were cut with a band saw for the week, month, and year that the product was being bottled.

Salesmen carried a similar template which they could superimpose over the labels of any merchandise and determine the age of the goods. This was of great advantage for stock rotation.

A short time later I became associated with my present firm and for proper control work again found it necessary to date labels. This time a band saw was not available, but the same principle was followed.

A template was made of stencil board and instead of notching with a saw, a punch was used (see illustrations). In this case the punch shape or design is changed to indicate the year. About 20 labels may be punched at a time, so it is not too inconvenient without a band saw

Several of our beverage customers have been advised of this method and are using it for control work.—*Walter T. Guzie, Chemist and Technical Advisor, Northwestern Extract Co., Milwaukee 2.*



Here's an Easily Made Spray-Coater

Protective coatings are effectively applied to metal surfaces of meat carts with a readily shop made spray gun in the Zion National Kosher Sausage Factory, Inc., New York City. Unit comprises a vacuum cleaner unit, rubber hose, and atomizer.

These metal carts, used for transporting meat around the plant, are thoroughly washed with soap. Then, as further protection against oxidation of the surface, they have to be coated with oil.

Rags were formerly used to apply the oil, but this system was not satisfactory. Next, a common insecticide gun was tried, but this clogged too often. Finally, the assembly, illustrated above, employing a vacuum cleaner motor as the power unit, was rigged up.

This does the job quicker, more effectively, and without breakdowns. The stream of air from the ¼-hp. vacuum unit draws the odorless, tasteless, colorless oil from an aluminum container and sends it through the spray nozzle to deposit a film on the metal surfaces of the carts.—*E. Anderson, General Manager, Zion National Kosher Sausage Factory, Inc., New York City.*

New Packages and Products

Pressure-Packed Coffee Makes Debut

Claimed to be an advance in flavor protection of coffee, the "pressure packed" can is now reaching local markets, with Standard Brands, Inc., reporting that its Chase & Sanborn coffee is packaged hot under pressure.

Nitrogen at relatively low pressure is introduced into the coffee can. As carbon dioxide escapes after the can is sealed, the pressure gradually increases.

The machine used to inject the nitrogen and seal the can was especially designed and involves several innovations.

Usual coffee packing methods require a cooling-off from roaster to can—involving some loss of aroma. The pressure-packed can is said to avoid this loss.

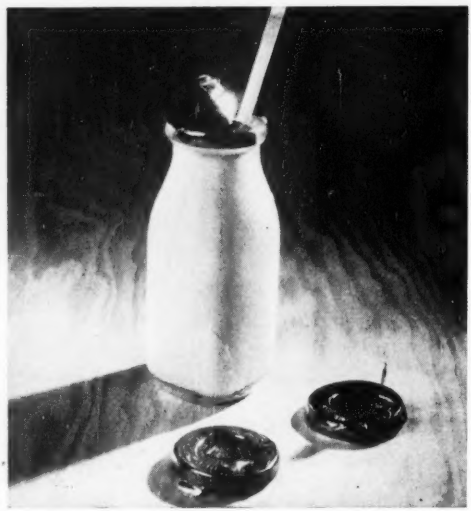
Consumers will hear a more pronounced hiss as they open the can. Another feature of the new can is its domed top. Cover has a groove that facilitates resealing.

Attractive Cap Designs

Durkee-Mower, Inc., Lynn, Mass., has a new packaging twist for its glass-packed marshmallow. Five different designs on the metal screw-top closures, each attractively illustrating a different use for the product or container, are hoped to up point-of-sales appeal.

Uses stressed for the marshmallow are: On baked apples, for hot gingerbread, for topping, and fluff and peanut butter sandwiches. The design at upper right in photo points up container reuse value as a refrigerator jar.

Caps are lithographed in blue and white. Printing is in black and white.



Aluminum Milk Cap Has Pull-Tab

Introduced at the recent dairy show is an aluminum closure for milk bottles, one variety of which features an extra pull-tab for quick insertion of straws.

The cap is designed to be stamped out right in the plant by a special machine made by Aluminum Co. of America that turns out 150 a min. If you want a top with the extra tab, just flip a lever on the stamping unit. No extra metal is required, since the tab comes out of what would ordinarily be scrap.

The tab was incorporated with use by school children in mind. Merely a simple pull and there's a hole for the straw.

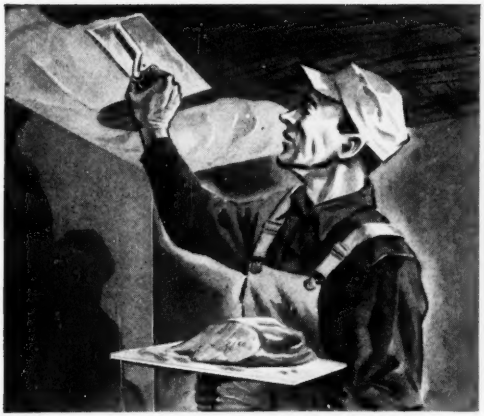
Frozen Concentrated Chocolate Drink

A 4-to-1 frozen concentrated chocolate drink is undergoing a limited marketing test in the Chicago area.

The maker, Beatrice Foods Co., Chicago, states its product contains fresh dairy ingredients from which only water has been removed. It is being tested in the 6-oz. can in conventional frozen food outlets.

Reconstitution is the same as for frozen orange juice. Resulting chocolate-flavored drink is stated to be indistinguishable from that prepared from fresh milk. Hot chocolate may be had simply by adding three cans of hot (instead of cold) water. Concentrated product may also be used as a syrup in puddings, cookies, cakes and desserts.

Ingredients are sugar, syrup, whole and defatted milk solids, cocoa, stabilizer and vanillin.



Portland cement plaster being applied to the ceiling of a room to operate at below minus 25 degrees F.

Asphalt emulsion being applied to a ceiling for a cold room to operate above minus 25 degrees F.

We have been asked . . .

"What is the best finish for a cold room ceiling?"

"I am designing a 10° below zero room for one of my clients," writes an architect. "Regarding the ceiling finish, would asphalt emulsion or portland cement plaster be the more practical? Walls will be finished with portland cement plaster."

For temperatures above 25° F. below zero, asphalt emulsion finishes are generally used on ceilings. You'll find asphalt emulsion an excellent adhesive, and because of its low permeability to air, it eliminates a great deal of moisture penetration. In addition, asphalt emulsion is light in weight and keys firmly to corkboard without the use of mesh or wire lath. It trowels on easily and rapidly. However, the shrinkage characteristics of these finishes make them unsuitable for applications where temperatures held in the room are lower than 25° below zero.

For the ceilings of a room operating below −25°, portland cement plaster is a more satisfactory finish. To help support this heavier finish, V-rib expanded metal lath should be securely fastened to the cork with the ribs against the insulation so that the lath itself is raised above the surface of the corkboard. A layer of portland cement is then applied to fill in the space between the cork and the lath. Another coat is then trowelled over the first and scratched. The third, or finish coat, is installed over the scratched second coat.

Furnishing the right answers to questions on low-temperature insulation problems is just one of the services offered by Armstrong engineers. The complete contracting organization they represent also supplies top-quality insulation materials and skilled workmen to apply them. The next time you need low-temperature insulation, call Armstrong.

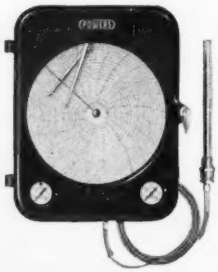
SEND US YOUR QUESTIONS: If you have any questions on the construction of low-temperature facilities, please do not hesitate to write to us. We'll see that you get a practical answer. Just address a letter or postcard to Armstrong Cork Company, 2301 Concord St., Lancaster, Penna.

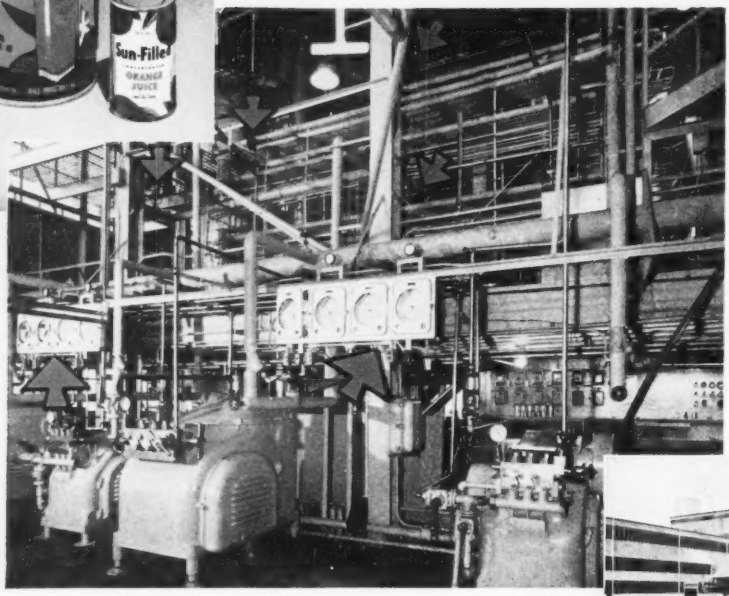
ARMSTRONG'S INDUSTRIAL INSULATIONS

MATERIALS - INSTALLATION

FOR ALL TEMPERATURES FROM 300°F. BELOW ZERO TO 2800°F.

Illustration below shows 8 of the Powers Recording Regulators controlling eight diaphragm valves regulating temperature of orange juice concentrate being processed by SKINNER Mallorizer. **At right:** Powers Series 100 Recording Regulator.





Above: Powers No. 252 Pressure Indicating Regulator

Powers Flowrite Control Valve

Quality control

in JUICE INDUSTRIES (Div. of Clinton Foods, Inc.) Modern Plant at Dunedin, Florida

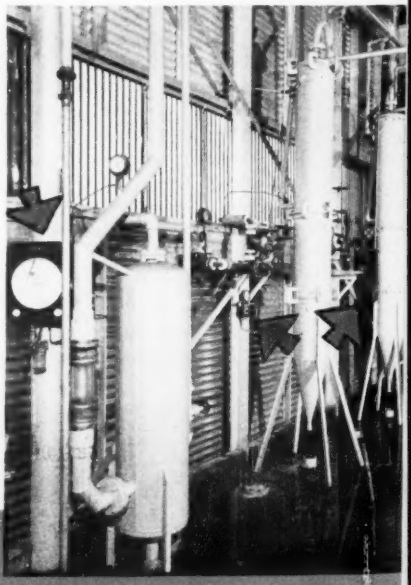
Increases soaring demand for their products

POWERS *Recording* **TEMPERATURE REGULATORS**

. . . controlling the SKINNER Mallorizer (above) and De-Oiler (at right) play their part in helping to maintain the uniformly fine flavor for which JUICE INDUSTRIES products are famous.

Whenever the quality of your products and your *profits* are are affected by accurate, uniform temperature regulation . . . consider POWERS. With almost 60 years experience and a wide variety of pneumatic and self-operated controls we may be able to help you select the best equipment for your requirements. If you have a problem of temperature or humidity control contact your nearest POWERS office or write—

(No. SC)



THE

POWERS REGULATOR CO.

Over 55 Years of Pneumatic Temperature Control • Offices in Over 50 Cities • See Your Phone Book

CHICAGO 14, ILL., 2723 Greenview Ave. • NEW YORK 17, N. Y., 231 E. 46th St. • LOS ANGELES 5, CALIF., 1808 W. 8th St. • TORONTO, ONT., 195 Spadina Ave.
MEXICO, D. F., Edificio "La Nacional" 601

Eye-Stopping Cartons

Doing the family shopping one day, we were stopped in our tracks by the eye-catching display formed by putting these two sets of packages together. Each package alone is quite attractive, but the continuous pictures, of plate and muffins, formed by putting them together on a supermarket shelf more than doubles the point-of-sales appeal.

The Chef Boy-Ar-Dee spaghetti dinner is put up by American Home Foods, Inc., Milton, Pa., in a yellow cardboard carton. It measures 8¼ in. high and 3½ in. wide. Printing is in red and there is a blue border around the spaghetti plate.

Carton for the Flakorn corn muffin mix is a deep brown with yellow printing. Product is processed by Flako Products Corp., New Brunswick, N. J.

Both going-together effects have been achieved with only one printing. The spaghetti box has a similar illustration on the back. To get picture of the whole plate, retailer has to turn the carton once at most.

Muffins on the mix box are printed all around, so they form a continuous picture any way they are placed on shelves. Each carton measures 3 x 5½ in.

Redesign Fillet Packages

Six-color packages, each featuring an as-it's-served photograph, have been created for line of quick-frozen fish fillets marketed by 40-Fathom Div. of General Foods Corp.

Product protection, consumer convenience and point-of-sales appeal were carefully considered in the redesign. The outer wrapper is of moisture-resistant, heat-sealed waxed paper. Fish is placed in a moisture-resistant pasteboard box with self-locking closure. Inner wrapping is laminated to the interior to assure easiest consumer handling. And selection of red, yellow and blue color combinations was aimed at creating maximum visibility under unfavorable selling conditions resulting from moisture or frosting on case windows.

Pre-testing of the package among housewives showed a preference for a picture of a finished dish that could

SCRUBBING CORROSIVE GASES ?

Fig. 645

Are your scrubbing nozzles as efficient as you think they could be? Do they resist the corrosion or wear conditions satisfactorily — produce the breakup and distribution you would like?

Outline your spray problem for us—if your liquid can be sprayed with direct pressure at all—Monarch can furnish the nozzles.

NOZZLES FOR:

- OIL ATOMIZING
- HUMIDIFYING
- AIR WASHING
- DESUPERHEATING
- SPRAY PONDS
- MILK POWDERING
- ACID CHAMBERS
- CONCRETE CURING

Write for Catalogs 6-A and 6-C

MONARCH MFG. WKS., INC.
2517 E. ONTARIO ST.
PHILADELPHIA 34, PA.

Increase consumer demand . . . Raise flavor levels . . . with

Huron **MSG**
MONOSODIUM GLUTAMATE 99+%
and
Huron **HVP**
HYDROLYZED VEGETABLE PROTEINS

For that perfection in food flavor which assures enthusiastic consumer acceptance and continuing demand . . . many food processors have already found Huron MSG and Huron HVP valuable aids in raising flavor levels.

Huron's specialized service is always available to suggest ways of obtaining maximum taste value consistent with economy through use of Huron MSG and HVP. To those who have not used our service, we suggest a simple way in which you can prove the advantage of using Huron MSG and HVP. For example, in

POULTRY PRODUCTS:

To the broths of chicken and turkey add 0.2% Huron MSG to make the best soup ever tasted. In canned poultry, whole, disjointed or solid pack, the use of 0.15% MSG retains the succulent, fresh cooked flavor. Delicacies such as smoked chicken or turkey take on even greater flavor appeal when MSG is introduced at 0.15%. Here it can best be applied by injecting a 10% Monosodium Glutamate solution into the various fleshy portions of the carcass. This use of MSG can also be employed to improve the eating quality of fresh roasted or broiled poultry. Huron MSG used at 0.25% in rich "a la king" sauces for poultry truly makes these foods "to the king's taste".

Call on us in confidence for assistance. Samples will be sent immediately with specific recommendations.

Huron
MILLING COMPANY
9 Park Place, New York 7, N. Y.
161 E. GRAND AVE., CHICAGO 11, ILL.
383 BRANNAN ST., SAN FRANCISCO 7, CAL.

be made from the product. And another distaff request was for recipe ideas and complete directions for cooking (see "Does Your Label Need Redesigning?" July '50 FI).

All products are being offered in the 1-lb. size.

Adds Cookie Mix to Line

Newest entry in the prepared baking products field is this cookie mix introduced by Lamont, Corliss & Co., New York City. It forms a logical tie-in with the Nestle chocolate products for which the company has long been noted.

A plain cookie is obtained simply by adding water. Addition of chocolate tidbits yields a Toll House cookie.

Illustration on the seal-end folding carton was reproduced by The Lord Baltimore Press, Inc., Baltimore, in its Fidel-I-Tone process. Label sports five colors.

Consumer acceptance of the new Nestle product is reported excellent.

Canned Chocolate Drink

A canned chocolate drink that requires no refrigeration was recently introduced by Golden State Co., Ltd., San Francisco. It will keep indefinitely in the attractive 10-oz. tin pictured above.

Made from whole and non-fat milk, the new product, called Choc-lac, may

THE TIN WE LOVE TO TOUCH

This is a tin can.

To the housewives who open 30,000,000 a day, there is probably nothing less glamorous. Not so to us. We love 'em . . . because we see the tin can as one of the greatest advances in living, the means of bringing more food and better food to millions of people.

That's why we're constantly working to improve cans . . . why Continental has a reputation for solving difficult problems, pioneering in new packaging techniques and in helping customers in every possible way.

No matter what you pack, it pays to know what Continental can do for you. Why not check with Continental today? We certainly would appreciate a chance to talk with you . . . and we may be able to help you out.

You can't beat Continental as a dependable source of supply!

CONTINENTAL CAN COMPANY

Eastern Division: 122 E. 42nd St., New York 17 • Central Division: 135 So. La Salle St., Chicago 3 • Pacific Division: Russ Building, San Francisco 4

THE BROWN COMPANY, Quality Paper Makers of Berlin, New Hampshire, says: "In seven months—

This Lubricant saved us $2,098.16"

"During the seven month period before using LUBRIPLATE No. 130AA in the bearings of our Kraft Mill Lime Kiln, we used a conventional oil of the density recommended. The cost of the lubricant for the period was $2,134.00. In the seven months that followed, we only used 128 lbs. of LUBRIPLATE No. 130AA for initial filling and replacement at the cost of $35.84. LUBRIPLATE No. 130AA only requires weekly applications whereas the former lubricant required daily application."

• • •

The Brown Company is a progressive organization that is continuously seeking ways to improve their products, their methods and to cut costs. Naturally, when they found LUBRIPLATE No. 130AA, a grease type lubricant with great adhesive qualities, high film strength, and with high heat resistance, they saw the possibility of using it to their advantage in the bearings of their kilns and other equipment.

LUBRIPLATE Lubricants are available from the lightest fluids to the heaviest density greases. They reduce friction, wear and power consumption, they prevent rust and corrosion, they last much longer than ordinary lubricants. There is a LUBRIPLATE Lubricant that is best for every lubrication requirement. Let us send you information about the use of LUBRIPLATE Lubricants in your industry. *Write today.*

LUBRIPLATE DIVISION—Fiske Brothers Refining Company, Newark 5, N. J., Toledo 5, Ohio.

DEALERS EVERYWHERE—CONSULT YOUR CLASSIFIED TELEPHONE BOOK

LUBRIPLATE *THE MODERN LUBRICANT*

be served hot, chilled, or right from the can. Processor envisions its use in school lunch boxes and at picnics because of the handy storage. Simply bring along a can opener.

Design of the can came in for quite extensive study. The present label was pretested among consumers for instantaneous product identification. Upper portion is white with chocolate brown lettering. The brown is repeated in the lower portion, inset with a red and yellow triangle.

Price of the beverage has been set in the soft drink range.

Liquid Spices for Home

Complete line of liquefied spices, from anise to turmeric, is being offered to housewives by Vanguard Associates, Chicago. It was felt that these spices, used by food processors for years, would help milady employ the fine art of seasoning foods.

Sold under the name of Savorizer Spices, the products come in a highly concentrated form in $2^{3}/_{8}$-oz. bottles. Complete instructions for many uses are included.

Wm. J. Stange Co., Chicago, produces the liquid spices, extracting aromatic flavors in the form of essential oils and gums. The seasonings are water soluble, thus do not need time to "cook in."

Shelf life tests indicated that the spices can be kept indefinitely in the kitchen without losing strength or flavor.

Package & Product Shorts

Canned Watermelon Juice

A canned fresh watermelon juice has been developed by B. F. Trappey's Sons, Inc., New Iberia, La., working in conjunction with American Can Co. The juice is particularly helpful in relieving the kidney disease, nephrosis.

Adds Strained Pears to Baby Food Line

Bringing the baby food varieties marketed by H. J. Heinz Co., Pittsburgh, to 24 is the recently introduced strained pears. Processed from Bartletts, it contains lemon juice to give high vitamin C content.

For Babies: Ready-to-Serve Cereal

Another new product for infants is a ready-to-serve Rice Cereal that has just appeared on grocers' shelves. Made by Gerber Products Co., it's a smooth-textured cereal that is supplemented with essential B-vitamins.

String-Opening Composite Container

The Metal Box Co., Ltd., England, is producing a new type cylindrical container made of cardboard and fitted with tin ends. A rip cord is fabricated into the cardboard near the top, and when pulled it cuts through and yanks the lid off. —*End*

NO, SIR! The Seal Won't Blow!

METALLIC-BACKED neoprene seals are used in this famous bearing — and they are engineered to *stay put*. They can't blow.

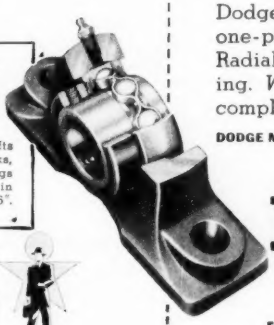
Your lubricant stays in; dust and dirt stay out; the result is years and years of trouble-free performance.

The "SC" Bearing is a new member of the Dodge 30,000 hour line. Modern styling. Rugged one-piece cast iron housing. Long inner race. Radial and thrust load capacity. Fully self aligning. *WRITE* for special "SC" bulletin, giving complete specifications.

DODGE MANUFACTURING CORPORATION, 2800 Union St., Mishawaka, Ind.

DODGE TYPE "SC" BALL BEARING PILLOW BLOCK

Precision built bearing for small shafts and moderate loads. Pillow blocks, flange bearings and hanger bearings available from distributors' stocks in shaft sizes ranging from 3/4" to 2-7/16".



CALL THE TRANSMISSIONEER, your local Dodge Distributor. Factory trained, he can give you valuable assistance on new, cost saving methods. Look for his name under "Power Transmission Equipment" in your classified telephone book.

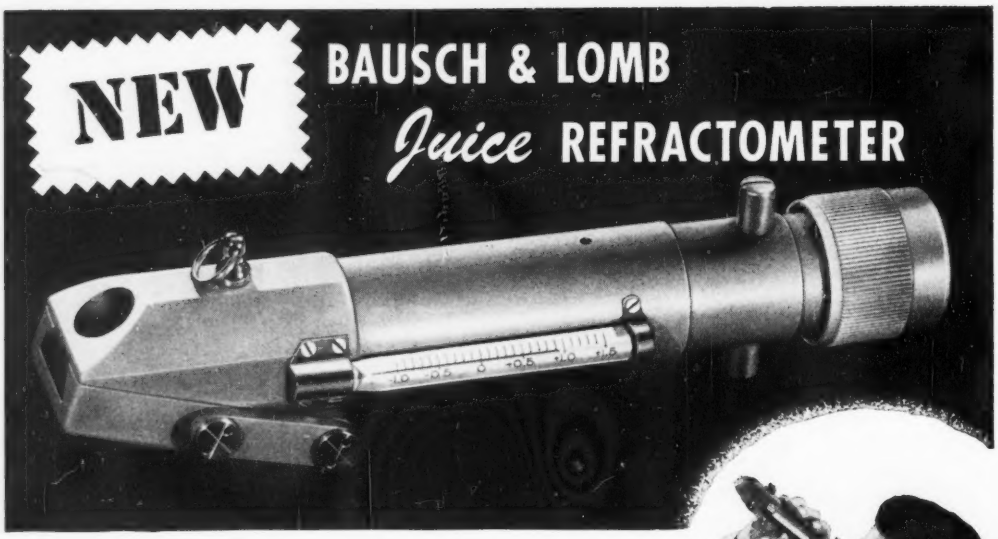
DODGE

of Mishawaka, Ind.

FIRST IN POWER TRANSMISSION MACHINERY

NAME PLATES

FOR YOUR NAME PLATE REQUIREMENTS, WRITE OUR SUBSIDIARY, CHICAGO THRIFT ETCHING CORPORATION, 1555 N. SHEFFIELD AVE., CHICAGO, ILL.



USES *BOTH* TRANSMITTED AND REFLECTED LIGHT

For the first time, a hand refractometer is now available that uses either reflected or transmitted light—transmitted light for clear, transparent solutions . . . reflected light for dense, opaque or turbid samples.

FOR QUICK, ACCURATE ANALYSIS of citrus or vegetable juices . . . for easy on-the-spot checking in the plant or in the field . . . the new Bausch & Lomb Juice Refractometer is an ideal instrument.

DIRECT READING with no interpolation necessary. A precise scale, from 0 to 25% total solids, provides for readings made directly with high accuracy. Scale lines alternate on each side of the center line, even tenths on one side, odd tenths on the other . . . avoiding a crowded scale.

WELL-DEFINED, COLORLESS DIVIDING LINE assures accurate readings, speed and convenience. Angles of prism faces, and the selective compensating filter make the dividing line sharp. Self-seating cover prevents damage to prisms.

FOCUSING EYEPIECE adjusts to accommodate individual user's eyes. Combined with an easy-to-read internal scale, this helps eliminate guesswork in routine refractometric observation. Wide aperture gives complete unobstructed view of entire scale and borderline.

WRITE for complete information and demonstration of the new B&L Juice Refractometer. Bausch & Lomb Optical Co., 603-1 W St. Paul St., Rochester 2, N. Y.

BAUSCH & LOMB *Juice* REFRACTOMETER

New Technology

Preserving Bananas With Sugar Plus Heat Saves on Refrigeration and Shipping

Subjecting bananas to a controlled heat treatment in the presence of added sugar is the basis of a patented process for preserving that fruit for use as flavor or stock in making pies, cakes, ice cream, or candy. The process can be applied to fully ripened or partly green fruit, or a mixture thereof, because the heat treatment is effective in converting the starch in unripened bananas to sugar. The process can be applied at the point of origin of the fruit, so that large seasonal supplies can be picked and preserved for use throughout the year. Transportation of stems and peel is avoided, and refrigeration is eliminated, thus effecting a marked saving.

In the practice of the invention, fruit is peeled and then macerated or pureed or cut into sections, preferably after it has been heated to about 100 F. Cane, corn, or beet sugar is then added and the mass is brought to boil for 3-5 min. depending on the type of equipment used. This is followed by quick cooling to about 100 F., after which certified color and flavor can be added if desired. The puree is then hermetically sealed in jars which are subjected to a sterilizing temperature of about 190 F. for ½ hr. Although the product contains more sugar than natural ripe bananas, it is not unpleasantly sweet.

Digest from U. S. Patent 2,507,564, issued May 16, 1950, on an application dated Aug. 6, 1945, to Paul R. Foote, Cincinnati, O.

Treated Peeled Potatoes Resist Discoloration

Whole, peeled potatoes can be processed in such a manner as to remain in a fresh marketable condition through comparatively long periods of storage. Crux of the process is to form a relatively thin cooked layer or casing on the peeled potato, and to use this layer as a storage zone for the retention of sulphurous acid or a salt thereof which will act as an enzyme inhibitor. In carrying out the patented process potatoes are peeled and trimmed, then cooked in hot water or steam sufficiently long to produce a cooked layer of outer starchy cells to a depth of 1/16-⅛ in. They are then treated with an aqueous solution of a sulphurous compound. Best results were obtained with a solution containing 1.6 percent sodium metabisulphite applied for 30 sec. A further, but not essential, step is to spray the sulphited potatoes with a dilute aqueous solution of an edible acid, such as citric, tartaric, or acetic. This increases the dissociation of the sulphurous compound and enhances its preservative properties. Experiments show that within 48 hr. after preservative treatment has been applied the sulphurous compound has penetrated to a depth of 5/16 in., or deeper than the cooked layer. Treated potatoes are bagged in parchment or cellulose acetate and stored at 38-42 F. They will keep for 3 weeks or more without showing signs of discoloration.

Digest from U. S. Patent 2,506,793, issued May 9, 1950, on an application dated Jan. 13, 1947, to A. F. Kalmar, Riverside, and R. W. Kilburn and H. M. Pancoast, Jr., assigned to Food Machinery & Chemical Corp., San Jose, Calif.

DAIRY

Non-Feathering Coffee Cream

Treatment with ion-exchange materials is the crux of a patented process for producing heat- and acid-stable milk products, particularly a stabilized cream product which, in either dried or reconstituted form, can be used in hot coffee or with berries without "breaking" or "feathering." In preparing this cream product it is desirable to start with skim milk and add the required butterfat at a later stage in the process prior to the drying step.

In carrying out the invention, pasteurized skim milk of pH 6.5-6.9 is modified by cation exchange acting in the sodium cycle. Approximately 60-70 percent or more of the calcium is replaced by sodium with the formation of sodium caseinate. This is carried over into the final dried product and makes it readily dispersible in water and hence easily reconstituted, as well as being more stable to the action of heat and acid. The cation exchange treatment is so conducted as to reduce the ratio of calcium to phosphorus in the skim milk so that when it is blended with butterfat, the blend also will have that reduced ratio. The reduction is accompanied by an increase in pH. If the latter is of the order of 7.5-8.0 or higher it may be reduced to the range commonly found in fresh whole or skim milk, say 6.5-6.9. Reduction may be effected by use of a cation exchange material acting in the hydrogen cycle.

The neutral skim milk is then condensed to 30-50 percent total solids, and to it is added a calculated amount of butterfat. This mixture is heated to 145-170 F. for 15-20 min., then homogenized and spray dried.

Digest from U. S. Patent 2,503,866, issued Apr. 11, 1950, on an application dated Nov. 2, 1946, to L. H. Chrysler and E. F. Almy, Columbus, O., assigned to M & R Dietetic Laboratories, Inc.

Sugar-Free Albumin From Cheese Whey

According to a new process recently patented, the centrifugal concentration of albumin from cheese whey is accomplished continuously, and at the same time the sugar content of the albumin is substantially reduced. In the manufacture of cheese it is common practice to centrifuge unclarified and precipitated whey containing about one percent of albumin by volume, to obtain, as one of the separated constituents, a concentrate of about 50 percent albumin. This product, however, contains as much as 6 percent lactose,

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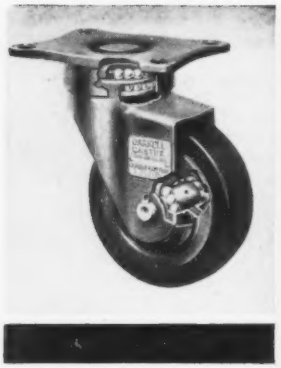
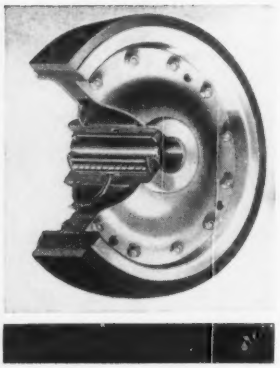




DARNELL CASTERS

Write for your copy of the 192 page Darnell Caster and Wheel Manual.

Enjoy the advantages of easily movable equipment, full protection of floors and the elimination of damage to equipment due to wracking - at no additional expense over ordinary casters and wheels.

DARNELL CORP. LTD. 60 WALKER ST., NEW YORK 13, N. Y.
LONG BEACH 4, CALIFORNIA 36 N. CLINTON, CHICAGO 6, ILL.

which is undesirable. The present process is directed toward an improved method by which the desired concentration of albumin is obtained by continuous centrifuging with simultaneous reduction in sugar content.

Precipitated whey is fed into a centrifugal, where albumin is separated and discharged as the heavier constituent. Initially the albumin not only contains lactose, but has a concentration much lower than that desired in the final product. Hence a part of the albumin discharge is recycled to the peripheral portion of the centrifugal in order to increase the concentration to the desired value. But, before the albumin containing concentrate is returned to the bowl it is diluted with water to form a mixture of albumin and lactose solutions. When this mixture is fed to the bowl the lactose solution is discharged with the whey, and the albumin is discharged in more concentrated form, say 50 percent by volume, with a lactose content of only 2 percent.

Digest from U. S. Patent 2,500,101, issued Mar. 7, 1950, on an application dated Sept. 10, 1946, to G. J. Strezynski, Chicago, and assigned to The De Laval Separator Co., New York City.

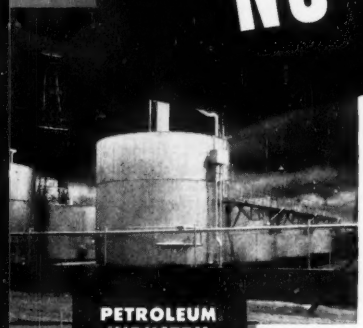
ENGINEERING

Methods of Beer Filtration

During beer filtration, yeast cells retain their shape but trub particles do not. As a result they are squeezed into the interstices of the filter material, decreasing the pore size, slowing down the operation and ultimately bringing it to a halt.

A very yeasty beer may contain 1,000,000 cells per ml. so that a filter must remove about 1½ oz. of yeast per bbl. Protein or trub particles will amount to much less. Particles are roughly the same size, about 8 microns in diameter. Since no woven material has meshes as small as this, filter media for beer rely on the myriads of traps found in masses of cellulose pulp, or on the small interstices of diatomaceous earth. Pulp filters trap yeast cells and trub particles throughout their mass. A single layer of a well-packed pulp filter removes about 90 percent of the yeast in the beer passing through it. But, a series of layers, with the beer passing through them in succession, is necessary for good filtration. Plate colony counts on samples taken from different layers of a single pad of a pulp filter, will show nearly the same numbers, indicating that filtration takes place throughout the mass. There is, therefore, no advantage, or little advantage, in backwashing such a filter. Asbestos, with fibers much finer than cotton or paper pulp, makes a medium in which

CORROSION PLAYS NO FAVORITES



PETROLEUM INDUSTRY

CHEMICAL INDUSTRIES

You must PROTECT or PAY
...you have no other choice

No business escapes the effects of corrosion. It costs industry over $6,000,000,000.00 annually. Yet much of this costly damage might be avoided by taking just two simple steps—

1. Check the danger points in your plant—manufacturing equipment, piping, valves, tanks, motors, and all similar items.
2. Protect them with Amercoat—the corrosion-resistant coatings; each designed to meet specific conditions.

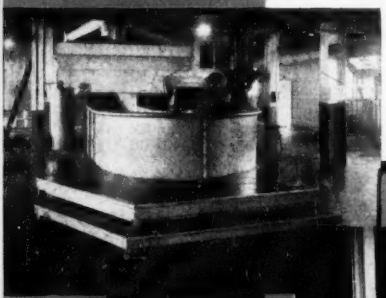
Most conventional coatings fail when corrosion threatens, because they are neither designed nor suited for severe service. Don't risk needless loss—protect now with Amercoat.

MEAT PACKING

AMERCOAT CORPORATION

A Division of
American Pipe and Construction Co.
4809 Firestone Blvd., South Gate, California

FOLLOW THE LINE OF *most* RESISTANCE



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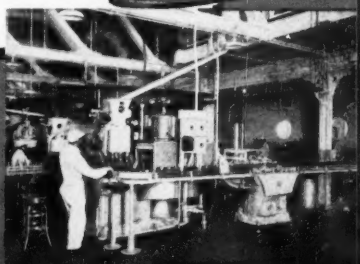
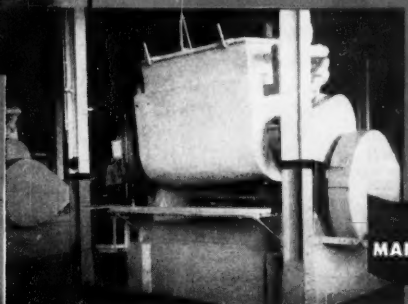
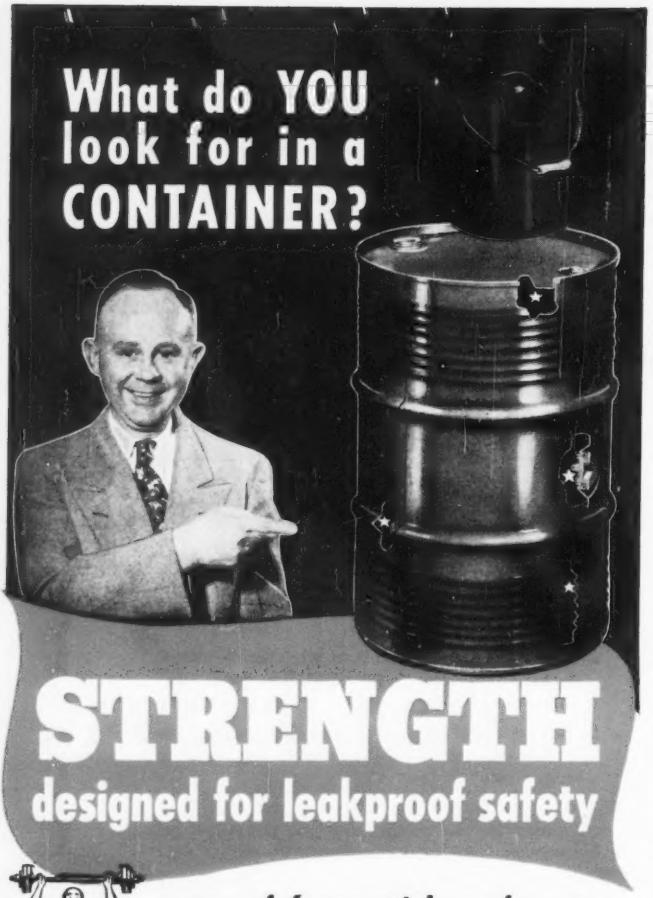


BEVERAGE PLANTS



RAYON MANUFACTURING



— one of 6 essentials you're sure of with Inland Steel Containers

Every detail of Inland Steel Containers is designed with *star* features — from positive closures to protective beads, welded seams, and double-seam chimes — to give your products the unsurpassed protection of a leak-proof, sift-proof and air-tight container.

And that is just one of six basic essentials that make experienced buyers consider Inland the best container source for any product. Besides superlative *design strength*, you are sure of . . . the unmatched *durability of steel* . . . a *variety of closures* to meet every need . . . *full-color lithography* that makes every container a "salesman" . . . *protective Hi-Baked linings* for special product problems . . . and selection from *a line that is really complete!*

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A-4

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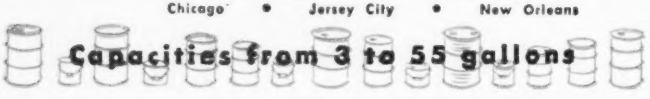

Capacities from 3 to 55 gallons

filtration takes place chiefly on the surface of the pad. Such filters may be backwashed effectively but also clog quickly on turbid beers. They do good work on clean beer.

Diatomaceous earth filters are also surface-type, but since the earth is fed in continuously, the surface is continuously renewed and maintained in a uniform state. From 1/3 to 1/10 oz. of diatomaceous earth per barrel is used. The amount required for ideal results differs with different beers and is best established by trial. Too much earth keeps filter pressure low, but fills up the filter rapidly; too little causes clogging of the filter and rapid pressure rise.

Centrifuging may substitute for storage settling to a limited extent. For best results, centrifuges should be followed by a polishing filter of the plate type with asbestos-cellulose-pulp pads. The output of a centrifuge for beer clarification is relatively low, therefore their adoption has been slow.

Digest from "Filtration," by J. H. Oliver, *Brewers' Guild Journal*, Vol. 36, No 429, 262-72, July, 1950.

FATS AND OILS

Process Inhibits Fat Spoilage

According to a recently patented process, fats and oils rendered from animal tissue can be treated so as to make possible long periods of unrefrigerated storage without developing rancidity or other evidences of spoilage. Novel feature of the process is the treatment of rendered fat or oil with gas derived from controlled combustion of natural gas.

Believing that progressive oxidation of fat, causing rancidity, is due to the presence of "bio-catalysts" which are complex compounds of the heavy metals, principally iron and copper, the inventor has discovered that these catalysts can be rendered inactive by the gas treatment. A suitable gas contains acetylene and carbon monoxide which are believed to be the effective constituents.

The entire rendering process is carried out in an atmosphere of the gas, and following filtration, gas is bubbled through the liquid fat. In the case of lard the result is higher quality, better palatability, and whiter color.

Digest from U. S. Patent 2,504,507, issued Apr. 18, 1950, on an application dated June 27, 1945, to M. E. Dunkley, Modesto, Calif.

More Efficient Fat Separation By Solvent Rendering Process

A new solvent extraction process, in which a liquefied normally gaseous hydrocarbon is used to dissolve the fat

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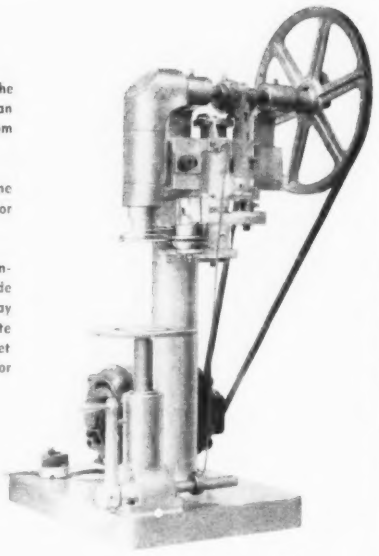
- **SEAMING MECHANISMS:** Seaming mechanism is mounted on a slide bracket, which can be moved away from seaming chuck to accommodate different diameter cans, and bracket is set and taper dowelled in place for each diameter can.
- **CHANGE SETS:** Change set consists of height spindle and seaming chuck. We use standard seaming chucks and rolls.



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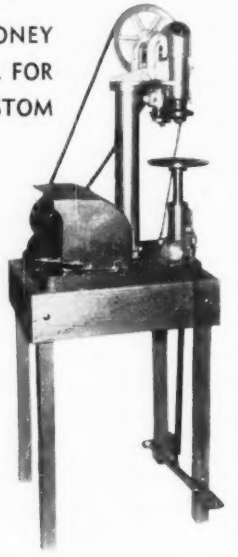
- Sealer can be changed from one diameter can to another in 2 minutes and does not require any seam adjustment after change.



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after it has been rendered from fatty animal tissue by the effect of heat and pressure has been patented. The rendering tank is under sufficient pressure to keep the solvent in a liquid state, and the temperature is high enough to aid in the separation of fat from tissue but below the critical point of the solvent. Suitable solvents are ethane, propane, and butane, up to decane, or a mixture of any of these.

Using propane, a temperature of 175 F. and a pressure of 500 psi. give satisfactory results. After the fat has been separated from the tissue, it dissolves in the solvent, and the resulting solution is treated in a continuous process wherein the fat is separated into components by chilling and destearinizing. Advantages claimed for the new process are: Reduction in time as compared with wet rendering, more efficient separation of fat from tissue, and simultaneous decolorizing, if desired.

Digest from U. S. Patent 2,503,205, issued Apr. 4, 1950, on an application dated Aug. 10, 1945, to W. M. Leaders, Chicago, and assigned to Swift & Co.

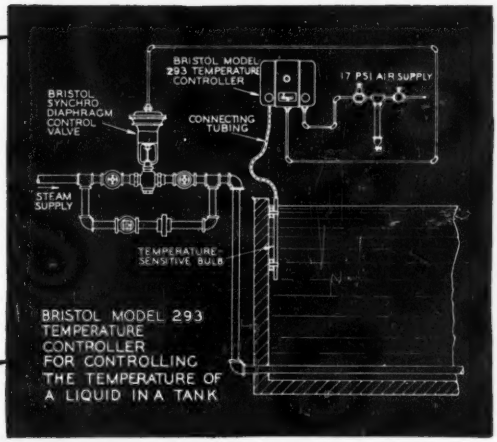
MEAT

Smoked Meat Product Made Without Casing

Novelty is claimed for a patented food product which, although similar in composition and use to smoked sausage of the frankfurter type, is without casing of any kind, and shaped into a flat, cake-like form. The cake of ground meat composition, about ½ in. thick and several inches in diameter, is wholly self-supporting when disposed on a flat grill and is readily subjected to the smoking process. It is sufficiently porous to be smoked throughout when treated for ½ hr. at 165-180 F. Penetration of heat and smoke brings about cohesion of meat particles throughout the cake, yielding a product that is firm yet tender, retaining all natural juices and flavor of the meat. Satisfactory results are obtained with a mixture of 60 percent beef, 40 percent pork, the latter being composed of lean and fat meat in equal proportions. A convenient method of preparing the mixture is to follow the directions for making a so-called frankfurter emulsion. On completion of the smoking step, and after 5 min. cooking by steam or other means, cakes are ready for distribution provided they are kept under refrigeration. The cakes may also be packed in suitable cans which are vacuum-sealed and processed in a cooking chamber or retort.

Digest from U. S. Patent 2,507,486, issued May 9, 1950, on an application dated Dec. 30, 1948, to Alfred Weissenbach, New York City.

WHERE VARIABLES *must be controlled* BUT NOT NECESSARILY *recorded*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BRISTOL SYNCHRO DIAPHRAGM CONTROL VALVE
CONNECTING TUBING
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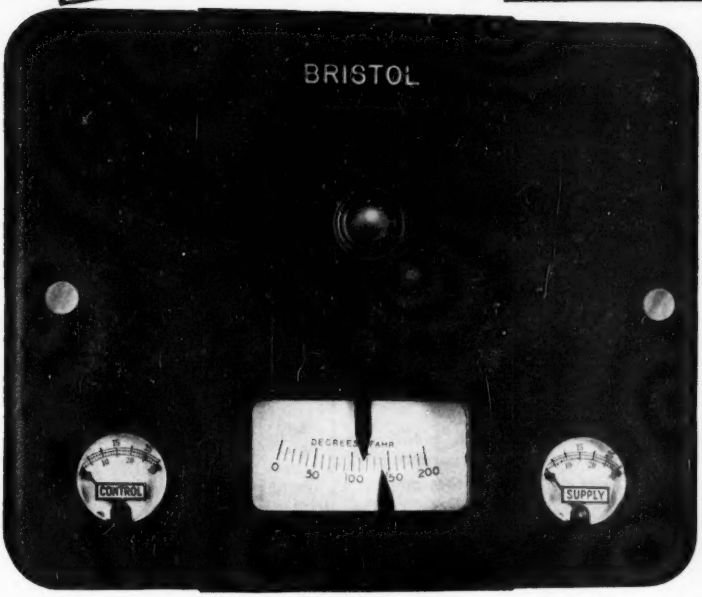
TEMPERATURE-SENSITIVE BULB
BRISTOL MODEL 293 TEMPERATURE CONTROLLER FOR CONTROLLING THE TEMPERATURE OF A LIQUID IN A TANK



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- Cooling
- Dehydration
- Curing and Smoking
- Roasting
- Baking
- Blanching
- Pasteurizing
- Sterilizing
- Evaporating and Distilling
- Drying
- Air Conditioning
- Hot Water Supply
- Meat Packing
- Canning and Preserving

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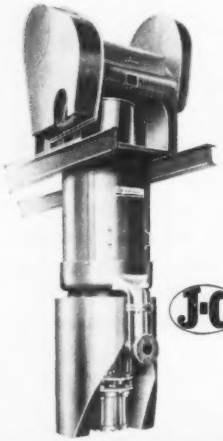

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BAKING

Casein Improves Pie Crust Mix

Addition of a small quantity of casein to the usual ingredients of a pie crust mix has been found to produce a lower crust that resists absorption of moisture and bakes free from objectionable sogginess. According to specifications covering the patented discovery, the proportions by weight of the improved mix may be: shortening 32 percent, flour 65, salt 2, baking powder 0.75, and powdered casein 0.25. The 2:1 ratio of flour to shortening may be varied between 1:1 and 3:1. Salt and baking powder may be omitted, and powdered casein may be used in quantities varying from 0.05 to 2 percent. The casein should be ground to approximate fineness of the flour. Sodium caseinate and other casein derivatives may be used. The effect of adding casein to the mix is its coagulation in the slightly acid dough formed when water is added. This is an important factor in reducing absorption of moisture into the resulting pie crust. Dried milk powder will not give results achieved by casein.

Digest from U. S. Patent 2,506,358, issued May 2, 1950, on an application dated Sept. 27, 1948, to C. G. Harrel, R. O. Brown, and Mary H. Kimball, Minneapolis, Minn., and assigned to Pillsbury Mills, Inc.

CONFECTIONERY

Explosibility of Starch Dusts

In handling large quantities of powdered starch, as in molding, dusting, and other candy-making processes, strict precautions are necessary to guard against explosions. Among recommended precautions are: (1) Elimination of all ignition sources; (2) prevention of dust clouds, and (3) the provision of explosive pressure relief vents in the plant.

Laboratory experiments were conducted by the US Bureau of Mines to study the effects of concentration, particle size, moisture content, admixture of calcium carbonate, and vegetable oil on the explosibility of cornstarch. Data obtained indicate that ignition temperature decreases with increase in concentration of dust cloud, decrease in moisture content, and decrease in particle size. The minimum ignition temperature of dry clouds of finely divided cornstarch was found to be about 390 deg. C. Minimum energy required for ignition of these dust clouds increased with moisture content and with increase in particle size.

Mixing a small quantity of edible oil with the starch reduced its dispers-

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*Based on actual case study

THE *Electric* INDUSTRIAL TRUCK ASSOCIATION
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ibility and thereby its explosibility. But when dispersed in air, even the oil-treated starch was capable of producing strong explosions. Addition of $CaCO_3$ reduced the ease of ignition and the violence of the explosion. However, to prevent ignition by electric sparks, about 60 percent carbonate was needed and by hot surfaces, approximately 90 percent.

Digest from "Recent Studies On the Explosibility of Cornstarch," by I. Hartmann, A. R. Cooper and M. Jacobson, Bureau of Mines. Report of Investigations 4725, United States Dept. of Interior, Aug., 1950.

CEREALS

Identifying Barley Varieties

Harvested barley for milling, malting, or other processing should be identifiable as to variety. In addition to such qualities as color, size, shape, and presence or absence of barbs, more minute characters observable under mild magnification, such as denticulation of the crease or median groove are often helpful. Large divisions such as separation of barley into 2-rowed or 6-rowed varieties can be readily made.

For more precise identification of varieties, the shape, size, and color of the lodicule or small leafy scale at the base of the barley corns has recently been shown useful. In some varieties the lodicule is relatively large and triangular shaped. In others it is little more than a somewhat hairy scale. Some lodicules are rounded as in Victoria barley; others are lobed (Marocco) and others are leaf shaped (Finisterre).

The husks of the grain protect the lodicule during steeping, germination, and kilning so that varietal identification is possible even in the finished malt. The examination is rather slow and tedious, but not difficult. Authentic variety samples are necessary for comparison.

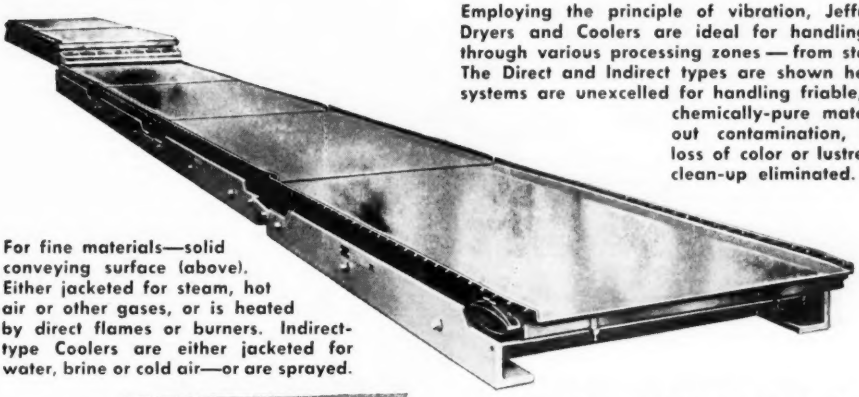
Digest from "Identification of Barley," by M. P. Bergal, *Revue des Fermentations et des Industries Alimentaires*, Vol. 5, No. 3, 78-81, June, 1950.

MISCELLANEOUS

Automatically Controlled Malting Apparatus

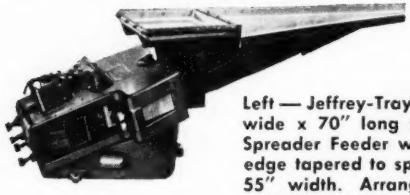
Germination of grain in the process of malting is an operation requiring close control of temperature and conditioned air. In a recently patented invention, a fully automatic apparatus is provided for delivering to germinating chambers of air of such temperature, humidity, and oxygen content as to

DRYING-COOLING by Conveying Action



Employing the principle of vibration, Jeffrey-Traylor Dryers and Coolers are ideal for handling material through various processing zones — from step to step. The Direct and Indirect types are shown here. These systems are unexcelled for handling friable, dusty, or chemically-pure material without contamination, breakage, loss of color or lustre. Difficult clean-up eliminated.

For fine materials—solid conveying surface (above). Either jacketed for steam, hot air or other gases, or is heated by direct flames or burners. Indirect-type Coolers are either jacketed for water, brine or cold air—or are sprayed.



Left — Jeffrey-Traylor 14" wide x 70" long tapered Spreader Feeder with one edge tapered to spread to 55" width. Arranged for automatic vibration control. Various styles and sizes with stainless steel or cast aluminum decks.

These Dryers and Coolers are valuable for processing under closely controlled conditions — material may be conveyed by vibration in thin layers and at controlled rate. Automatically controlled at each setting — assures desired time and depth of exposure to the drying medium at each point in the drying process. We build "custom-built" systems to suit particular conditions — make them in standard lengths, each independently powered. Sections arranged in right combination for any job. For Drying and Cooling — see Jeffrey

Typical HD 33D Jeffrey-Traylor Direct-type Cooler section. Cooling by direct contact with cool air — passes upward through bed of material as it travels over the finely perforated or louvered conveying surface—uniform heat transfer from solid to air producing rapid cooling.

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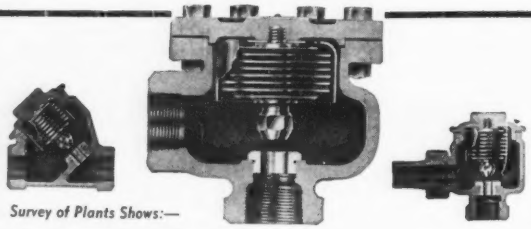

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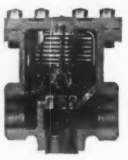

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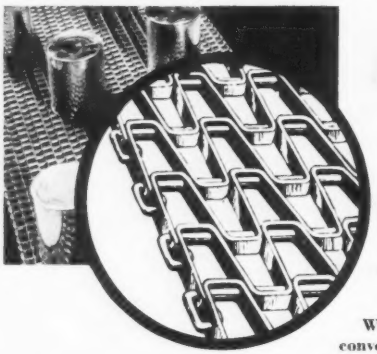

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insure the best conditions for the germinating process.

In general, the apparatus comprises a germinating chamber, fan, air conditioner, and ducts to form a normally closed air circuit. Ducting is provided with an inlet for fresh air to the fan, an outlet for exhaust air from the germinating chamber, and interconnected inlet and exhaust valves. Latter are operated by a servo-motor controlled by thermostat located near the outlet.

There is also a CO_2 controller which will override the action of the thermostat should the latter, under the influence of a falling temperature, reduce the percentage of fresh air drawn into the system and thus fail to maintain a low percentage of CO_2.

Digest from U. S. Patent 2,500,775, issued Mar. 14, 1950, on an application dated Sept. 3, 1948, to F. C. Stewart, Glasgow, Scotland, assignor of one-half to Robert Boby, Ltd., Bury St. Edwards, England.

Controlled Yeast-Fermentation Improves Dried Egg Whites

Egg white must be freed of glucose before drying if a stable product is to be obtained. Spontaneous fermentation by bacteria naturally present is generally used, but yeast action has been tried in a few cases. The yeast-fermented dried albumen is stable enough, but can have a marked yeasty flavor if yeast cells are not completely removed. Bakers' yeast at the rate of 1g. per 100g. of separated egg white will ferment the glucose completely in about 8 hr. at 50 F., although at 32 deg. 1/10 percent glucose is left after 24 hr.

A centrifuge of either the Sharples or De Laval types may be used to remove the yeast from the fermented white. Either machine removes yeast efficiently, but there is more frothing with the Sharples and the dried white produced by it had a slightly reduced aerating power compared to that separated in the De Laval centrifuge. Storage and other tests indicated that the dried white was fully equal in solubility and foam density to dried, bacterially-fermented whites. Samples made into meringues, marshmallows, and fillings, yielded products of normal consistency and flavor for dried whites. Whites that had been subjected to a minimum of frothing before drying made the best products. The shorter fermentation time and improved control possible with yeast fermentation are advantages, and the superior bacteriological quality of the yeast-fermented whites is also in its favor.

Digest from "Dried Albumen: Removal of Sugar by Yeast Before Drying," by J. R. Hawthorne, *Journal of the Science of Food and Agriculture*, Vol. 1, No. 7, 199-201, July, 1950.

—*End*

Yes—J&L quality controlled methods of manufacture are now being applied to the production of Steel Pails. You now can buy J&L Steel Pails in one-gallon to ten-gallon capacities . . . with interior coatings designed to ensure the safety and purity of your product.

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Food Industry News

Foods Sterilized by Radiation Are Nutritious But Costly

Packaged food can be sterilized instantly and permanently without loss of nutrients by the use of radiation, Bernard E. Proctor, Massachusetts Institute of Technology, told the Cornell Section of the American Chemical Society recently.

Experiments in MIT's Samuel Cate Prescott Laboratories of Food Technology have indicated that the rays kill bacteria in the food whether the container is made of glass, fiber, plastic or even metal, provided the material is less than one inch thick, Dr. Proctor said.

A wide variety of meats, fish, shellfish, dairy products, fruits, vegetables, juices, cereals, and spices, he said have been sterilized by cathode ray treatment at MIT. Cathode rays are streams of electron "bullets" shot from a vacuum tube. The time required for complete sterilization of any of these materials is less than five seconds.

The effects of cathode rays on vitamins and on essential amino acids in foods, and on bacteria and enzymes in animal and plant products, also have been studied, Dr. Proctor said, and in all cases "the losses in food nutrients were insignificant."

Enzymes in foods have been found to require more severe exposures to cathode rays than the microorganisms that are the common causes of spoilage, he noted.

Other Factors

Although this form of sterilization thus presents highly interesting possibilities, the installation and maintenance costs of cathode-ray equipment may limit its usage at present, according to Dr. Proctor. "Another limiting factor in some cases may be the color and flavor changes attendant upon cathode-ray irradiation. These changes vary greatly with the products treated. Sometimes odors develop that are dissipated by normal procedures subsequently used for table preparation. Means of minimizing some of these undesirable changes have been found. Flavor and odor changes that occur in milk and orange juice when irradiated at room temperature, for example, can be obviated if these products are irradiated in the frozen state."

Insects in cereal grains and flour may be inactivated by radiation without damaging the baking qualities of the flour, Dr. Proctor continued, and the same technic has been found applicable to the sterilization of surgical sutures, animal casings, pharmaceuticals, antibiotics, and textiles.

Cathode ray treatment is one of several new sterilization methods tested in recent years in an attempt to eliminate the changes in flavor, color and texture that often accompany the conventional technics based on heat. The temperature of foods treated with cathode rays is raised only about 1 or 2 deg. C.

"Many questions are still to be solved before it will be possible to apply such radiations economically and efficiently to the processing of large quantities of food at the rapid production rates required in large food-manufacturing operations, but progress is being made in this direction," Dr. Proctor concluded.

California Citrus Sales Total $144 Million

Despite the second consecutive winter of damaging cold, fresh fruit and products sales of California Fruit Growers Exchange totaled $144,000,000 f.o.b. California-Arizona during the fiscal year ended October 31, Paul S. Armstrong, general manager of the Sunkist marketing cooperative, told directors at their annual meeting.

Shippers affiliated with the Exchange moved almost 63,000 carloads of oranges, lemons and grapefruit to the fresh fruit market during the year. This was equivalent to 75 percent of the total California-Arizona shipments. An additional 380,000 tons, equivalent to 22,000 carloads of fresh fruit, was processed by the two products plants affiliated with the Exchange.

Orange Juice Trebles

Biggest volume item in the processed field was frozen concentrated orange juice with a pack of 2,000,000 gal. during the year, double the previous year. The California pack may reach 6,000,000 gal. next year, the report said. Florida's concentrate total this past season was about 22,000,000 gal.

One of the brightest spots in the entire processing picture is the production of lemonade mixes, both frozen and non-frozen. Received well by the consuming public, these products offer a high rate of return for the fruit used in them. Since practically all of the lemons produced commercially in the United States come from California and Arizona, it is up to this area to make the most of these opportunities.

Raw Materials Awash

Fluming is a fine thing in its place, but the flooded Tuscarora Creek overdid things at the National Fruit Product Co., in Martinsburg, W. Va., during the November storms. One million pounds of apples floated right out of the plant, causing an estimated loss of $30,000 to the company. (Wide World)

Hope Higher Farm Output Will Stall Food Curbs

Higher farm output is the best safeguard against food controls in the opinion of Ralph S. Trigg, PMA head, whose job would cover administration of food orders and price ceilings.

"Adequate supplies are the best defense against inflation," he said, "and are the surest way of minimizing, or at least postponing, the need for controls over agriculture." He warned, however, that PMA is prepared for emergency action should it prove to be necessary.

Trigg also pointed to the big government holdings of many foods as placing agriculture in a strong position during the early stages of the all-out defense program.

Hawaiian Sugar Yields 14 Tons Per Acre

A world's record for tons of raw sugar per acre was claimed recently when the Ewa Plantation, Hawaii, completed processing its 1950 crop. Yield recorded was 14.05 tons per acre when the 59,191-ton total had been ground.

The Ewa figure surpasses what was also said to be a record when Waialua Agricultural Co., Ltd., a month earlier announced its average 1950 yield at 13.82 tons per acre.

The increases were said to be the result of better irrigation, fertilization and cultivation methods as well as the continued good performance of cane variety 37-1933 developed by the Hawaiian Sugar Planters Assn.

The Hawaiian Sugar Planters Assn. is continuing its experiments in interrupting the sex life of sugar cane. Having already proven that night lights in cane fields suppress seed bearing tassels, the new experiments are to determine at which angle the light should strike, which hours of the night are the most effective, total electrical energy required per acre for complete control, and the exact time flower bud differentiation starts.

Grocery Manufacturers Look At Job Ahead

Facing up to the realization that they have a big job of supplying both military and civilian requirements for an indefinite period, the Grocery Manufacturers of America, at their 42nd annual convention, heard teamwork emphasized at the three-day session at New York's Waldorf-Astoria.

Paul Willis looked at the job ahead from the viewpoints of the farmer, manufacturer and distributor and declared that all three segments are in good shape to supply the food for our defense program. Willis, however, pointed to one disturbing threat on the home front—the insidious anti-business propaganda, which is becoming more and more harmful to the nation's economic life. He urged the grocery manufacturers to join in doing a thorough job of propagating the true facts to the American people.

Ralph S. Trigg, PMA Administrator, told the producers that his agency is prepared to act as a "claimant agency" for the food industry, appearing before the allocation boards to press claims for needed critical supplies. Their first job, he said, is to determine minimum needs, below which it is not possible to maintain food production schedules. Trigg thought few food controls would be necessary for the emergency as it appeared in November. PMA is prepared, however, to act promptly with any controls that might be required for all-out mobilization.

Despite the uncertainty of the times, the National Biscuit Co. is going ahead with plant modernization and expansion. President George H. Coppers said the company has spent $60,000,000 on new plants and equipment since the war, and plans to spend a like amount in the next five years.

"Naturally, we have wondered about the advisability of building plants in these times of high costs," Coppers said. "We have wondered about how many plants we will finish and how many will be held up or taken over by the government if we have total war. But the answer we always come up with is that we can't afford to wait." The company, he said, hopes to convert from 20 plants to 10 modern ones within the next five years. Moreover, he added, the company is making a project of mechanical development. "We feel that progress must be planned. It can't be left to chance."

The job of the new mechanical development division is to find better and more efficient procedures than are now employed in turning out the company's products.

"PLEASE, MRS. SWANSON! WE HAVE TEMPERATURE GAGES ON THE KETTLES!"

Frozen Quality, Bacteria Not Closely Related

Results of recent research on the processing of canned and frozen foods were revealed at the 3rd annual food processing meeting, held by the New York State Experiment Station, at Geneva, in mid-November.

Studies on peas, beans and corn, reported by G. J. Hucker, indicate that, in general, there is no real relation between the number of organisms present prior to freezing and the quality of the vegetables when frozen and stored over 18 months at temperatures of 10, 0 and −10 deg. F.

Quality was determined by taste studies, chemical analysis and vitamin content. The number of organisms present per gram in peas, beans and corn were noted at various intervals during the storage periods. Frozen peas as collected varied from 1,300 to 870,000 bacteria per gram. It would be indicated that not more than 50,000 organisms per gram should be present prior to freezing in order to reflect average sanitary operating conditions.

In the case of string beans the bacterial content varied from 2,000 to

16,000,000 per gram and it would be indicated that as a bacterial standard beans entering the freezer should not contain more than 100,000 organisms per gram.

A series of samples of corn ranged from 81,000 to 3,500,000 bacteria per gram, and to reflect good operating conditions should not exceed 200,000 grams when entering the freezer.

Effects of processing and storage of foods on starches and proteins was reported by P. E. Ramstad, School of Nutrition, Ithaca, N. Y. Starch splitting enzymes act very slowly upon raw, undamaged starch, he said, even in the presence of optimum moisture and temperature. Severe mechanical treatment, or heating starch in water causes it to become very susceptible to attack by these enzymes. On aging starch pastes they are likely to become less susceptible to enzymatic hydrolysis. The rate at which this change occurs is a function of temperature.

Proteins are more complex in structure and less thoroughly understood than other food constituents. To a large extent their nutritional value is a function of their amino acid composition. However, other factors are also important. In certain cases the effect of heat is to enhance the nutritive value of a protein. Under other conditions heat may have the opposite effect. This phenomenon has been explained on the basis that a physical change in the protein molecule may alter the rate at which certain amino acids are released during digestion.

L. E. Clifcorn, director of fundamental research, Continental Can Co., Chicago, emphasized recent developments in aseptic canning.

The proper use of aseptic canning and agitating processing methods will be responsible, he thought, for the improvement of quality of many canned foods by reducing "over-cooking" during the sterilization process. Canned fluid milk with fresh milk flavor and canned vegetables superior to present frozen foods are realities.

Much Work Remains

In addition, valuable research is being conducted on cathode ray sterilization of canned foods and the use of antibiotics for food preservation. These may be ready for commercial application in ten or twenty years, but much work remains to be done.

The American housewife is the monopolist in the American food industry. Canned foods offer her relief in the battle for the family dollar by offering high quality, nutritious food, at a cost of $1.44 for each $1.00's worth of canned foods on the 1935-39 market as compared to an index of $2.00 for all foods.

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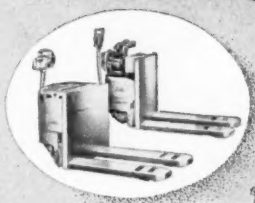

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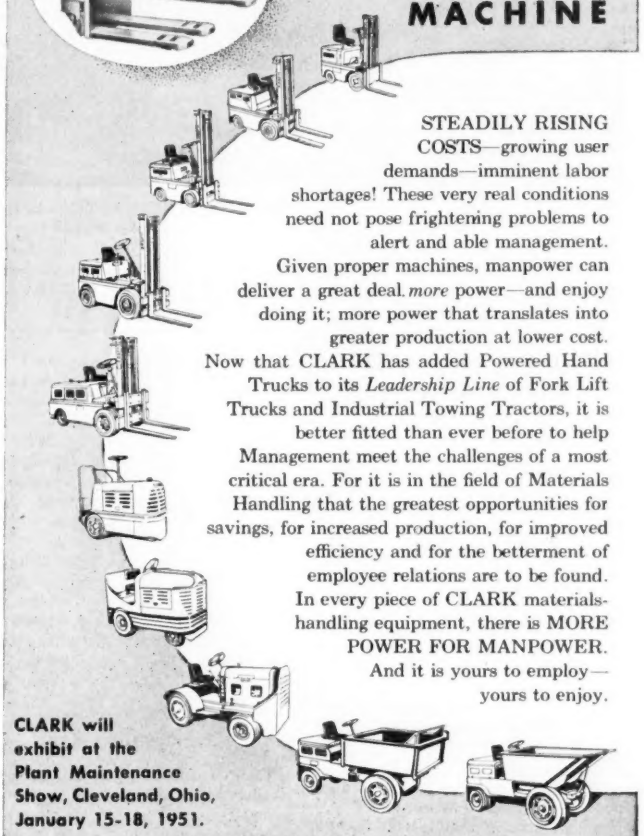

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Pillsbury Winners

Victor in Pillsbury's national baking contest helps President Philip W. Pillsbury hold the prize cake at New York's Waldorf-Astoria, last month. Mrs. Peter Wuebel, Redwood City, Calif., is the lady who carried off the $25,000. Mrs. Bernard Derousseau, Rice Lake, Wis., winner of the $5,000 first prize in the junior division, is being congratulated by the Duchess of Windsor. (Wide World)

Western Fishery Groups Aid Dam Opponents

Fishery groups vigorously opposed the suggested construction of two hydroelectric dams on the Cowlitz River in southwest Washington, at a hearing conducted in Tacoma, by the Federal Power Commission. Labor and public power groups, however, supported the application of the City of Tacoma to dam the Cowlitz.

Robert Schoettler, acting Washington state director of fisheries, declared that a large share of the state's third largest natural resource, fisheries, would be destroyed by the dams and proposed that Tacoma look to the Lewis River, "where serious damage to the fishery has already occurred," for additional power. Schoettler denied claims of Tacoma City Light biologists that they could handle fish both up and down stream and described the Cowlitz as "the last major salmon producing stream in the Lower Columbia area."

Swift Releases Patents On Monoglycerides

Ice cream and confectionery manufacturers who use monoglyceride compounds in the manufacture of their products will benefit by a recent notice from the U. S. Patent Office that patents covering use of these compounds have been dedicated to the public.

Individual manufacturers may now have use of these patents without license or payment of royalties.

Use of monoglyceride compounds in ice cream was developed by Swift & Co. about 12 years ago. They have been used extensively since that time by Swift and other manufacturers.

Patents were granted to Swift & Co. (No. 2035378 and Reissue Patent No. 22858) but these were made available to the industry through licensing.

Swift & Co. feels that free use of these patents would benefit the entire ice cream industry, and has filed in the Patent Office a dedication of them to the public. Information on use of the methods may be had by requesting the Patent Office for copies of the patents.

San Diego Packing Co. Shifts Ownership

The San Diego Packing Co. has been purchased by Earl M. Nielsen and a group of associates and is operating under the new ownership with Nielsen as president and general manager.

The packing plant has a capacity of 130 tons of tuna and did an annual business of about $5,000,000 under the former ownership. The new owner is planning for expanded markets.

Nielsen, a former High Seas Tuna Packing Co. official, recently announced plans for building a 180-ton tuna packing plant in San Diego and organized the California Tuna Packing Co. to operate that business. The new company now expects to have this plant in operation within a year.

Both of Nielsen's tuna packing companies will maintain separate identities and have different boards of directors. However, San Diego Packing Co. will pack for California Tuna Packing Co. as well as under its own label until the latter company's new plant is in operation.

Joseph H. Dempsey, of San Francisco, and associates, were the sellers of San Diego Packing. New officers of the company in addition to Nielsen are W. L. Robinson, vice-president, and Glen D. Martin, acting secretary and treasurer. The officers with Frank Rouse, of Los Angeles, make up the board of directors.

QM Plans Advance Guide By Mid-January

In view of industry inquiries and the uncertainty of the market, which hinges on the military picture, the Quartermaster hopes to have advance information on expected military food requirements around Jan. 15. This will serve as a guide to the food industry as to what may be expected in the April 1 estimates. Should all-out war break in the meantime, however, a "run" on the canners and packers may be expected.

As to stockpiling, there is none contemplated on a substantial scale. Certainly not of the canned commercial types of foods. Canned goods are presumed to have an average life of two years. The "life" varies with type of canned goods and type of storage. This matter of long-range stockpiling is never a satisfactory one. Once the canned goods are close to two years old they have to be used up.

As for stockpiling the combat type, this too has its disadvantages. It is good to stockpile the non-perishable types, but in view of Army policy to put men on fresh food diets wherever possible, who is going to eat all the combat non-perishable type if "peace" should come in combat areas on short notice.

QM's policy has been to keep a sizable stock for maneuver use, but no large quantities are proposed for purchase at this time. Apparently QM has plenty of combat rations on hand and more are being acquired.

Florida Still Expanding Frozen Citrus Plants

Since the close of the 1949-50 season the Florida frozen citrus concentrate industry has expanded at such a rate that it could produce during the 1950-51 season as much as 40,000,000 gal. of frozen orange juice concentrate. The output last season was totaled at 21,647,000 gal.

In the 1949-50 season 17,300,000 boxes of oranges out of a total pack

of 57,800,000 boxes were used for the frozen concentrate. On the basis of the new capacity it could now consume close to 35,000,000 boxes of an estimated 1950-51 crop of 62,500,000 boxes.

Of the 19 individual plants in Florida now listed as producers of frozen juice concentrate, eight have expanded capacity by a considerable amount and three entirely new plants have been built. The new plants are those of B. & W. Canning Co., Groveland, 10,000 gal. a day; Fosgate Co., Forest City, 6,000 gal. a day; Rossi & Co., Bradenton, 4,000 gal. a day.

Companies that have increased capacity, according to the Florida Citrus Commission's latest figures, and the amounts of the increases are as follows:

Pasco Packing Co., Dade City, from 42,000 gal. a day to 60,000 gal. Florence Foods, Inc., at Florence Villa, from 10,000 to 20,000 gal. Adams Packing Co., at Auburndale, from 10,000 to 20,000 gal. Plymouth Citrus Growers Assn., Plymouth, from 6,000 to 12,000 gal. Snively Groves, Inc., Winter Haven, from 11,340 to 22,680 gal. Sargeant Concentrates, Inc., Lakeland, from 7,000 to 14,000 gal. Winter Garden Citrus Cooperative, Winter Garden from 10,000 to 20,000 gal.

The total capacity of the Florida industry, now estimated at 40,000,000 gal. a year, or nearly twice as much as was produced last year, is a flexible figure, depending upon the number of days each plant is operated, the average being about 150 days.

The largest single plant, that of Pasco Packing Co., has been entirely streamlined, with all operations under

Better Coffee Trees

Researchers, headed by Dr. William H. Cowgill, hope to improve coffee growing in Central America by applying technics similar to those used by fruit growers in the U. S.—selecting superior trees and propagating them. The work is being carried on in Guatemala.

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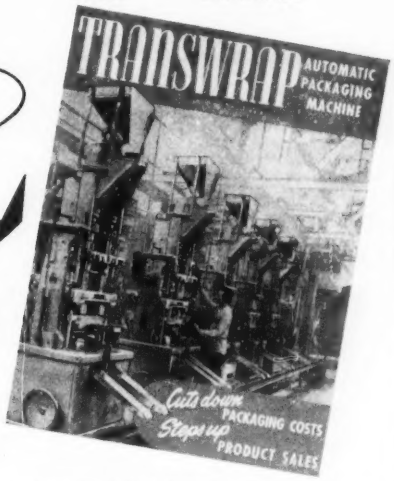

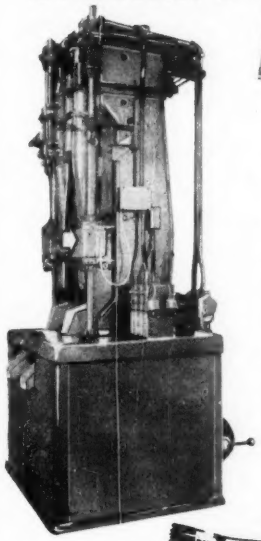

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Flavoring of Another Kind

USDA's Distinguished Service Award goes to the volatile flavor concentrate research team of the Eastern Regional Research Lab. Assistant Secretary K. T. Hutchinson, makes the presentation, which is accepted by R. K. Eskew (right). P. A. Wells, lab director (left) and G. E. Hilbert, chief of BAIC, watch.

one roof, at a cost of approximately $750,000.

Marketing conditions have not been ideal for this rapidly growing industry, which has expanded its capacity 100 times in the first five years of its existence. The boom in the industry in the past year has had unfortunate repercussions. Prices of the fresh fruit were pushed up to $3.50 a box, orange groves doubled in value and the concentrators themselves made their own market more difficult by advancing prices until the six-ounce can, which makes 24 oz. of orange juice, hit a retail price of 31c. Then demand began to slip and some of this high-priced concentrate is still unsold. Since then the retail prices have dropped to 22c. with some dealers offering the concentrate as a bargain at 17c.

H. R. Cloud, vice-president of Minute Maid Corp., whose views probably reflect those of most of the industry, has commented on the situation in this way:

"At the end of last season we found ourselves in the commodity speculation business rather than in food merchandising. We produced more than 8,000,000 gal. of concentrate, but the cost was high. If concentrators are to move a larger proportion of this season's larger crop, it must be at a more equitable price and one the retail buyer will accept."

The Florida concentrators are obliged to meet stronger competition from California, which long has sold its orange crop largely as fresh fruit but now is in the concentrate business. Another form of competition for the concentrate producers is the "ade" beverages, containing a smaller amount of citrus juice than the concentrates, but selling at 25 or 26 cents for a 46-ounce can. In the opinion of some in the trade, however, this "ade" business can be helpful in putting the Florida concentrate output more strongly into the soft drink field.

Concentrate producers started their production lines for the 1950-51 season around the middle of December.

Dairies Are Told to Correct Own (Gov't. Induced) Ills

A government spokesman recently told the nation's dairy farmers that the present dried milk, cheese and butter surplus mess is a challenge to the dairy industry. The industry should "set about correcting its own ills" was the advice.

The advice came from Stanley Andrews, director of USDA's Office of Foreign Agricultural Relations during the 34th annual convention of the National Milk Producers Federation in Minneapolis.

"Viewed from the standpoint of its statistical position, the dairy industry looks pretty sad," he said.

The government's support programs have increased the supply of dairy products so that now the government is the main market for a good portion of butter, dried milk and cheese.

"This is not only an intolerable situation for the government; it is a situation which, if not corrected in some way, may eventually destroy the industry," Andrews pointed out.

He believes the present high rate of industrial activity will take a bite out of the huge pile of deteriorating food in the hands of the government.

Andrews pointed out that the 15,000,000 tons of farm produce, including dairy products, shipped abroad annually during the past five years helped to keep farms operating at top output, kept prices up, and did somewhat alleviate surpluses. But the weak note in all this is the fact that about 60 to 70 percent of those exports were paid for with U. S. taxpayers' money which was given the foreign countries.

Government Plans Control Of Critical Materials

Detailed statements of critical material requirements will soon be sought from food and other essential industries, in preparation for the imposition of government controls. Barring actual outbreak of World War III, the outlook for these controls over industry, according to top government officials, goes about like this:

Something similar to World War II's Controlled Materials Plan will be pushed strongly, but complete control will not be in effect before next July. Present cutbacks of aluminum, copper, and other scarce metals will be tightened. Allocation programs will be stepped up along about February or March, when industrial and military requirements will be better known.

In the meantime official policy is to give all possible government aid to the expansion of production and supply of critical raw materials.

Hope is that at the end of one to two years, supplies of such materials as aluminum, steel, copper, and others will have expanded to the point where they will support both the bigger military establishment and a "normal" civilian demand with only a minimum of government controls.

FDA Caught in Cross-Fire On Bread Standards

Already under attack by industry spokesmen for its tentative bread standards, F&DA early in November was assaulted from an unexpected quarter. Eight national organizations with a membership of nearly 20,000,000 are asking that the proposed standards be amended.

Most of the exceptions taken were to the optional ingredients, particularly bread softeners. The deadline dates were extended several times to give interested persons a chance to present their case.

But the independent action of cooperative and labor groups was apparently not expected by Food & Drug.

Among the leaders of organized labor, organized agriculture, cooperatives and consumer groups, who submitted letters to Oscar Ewing, Administrator of the Federal Security Agency, and to

(*Turn to page* 147)

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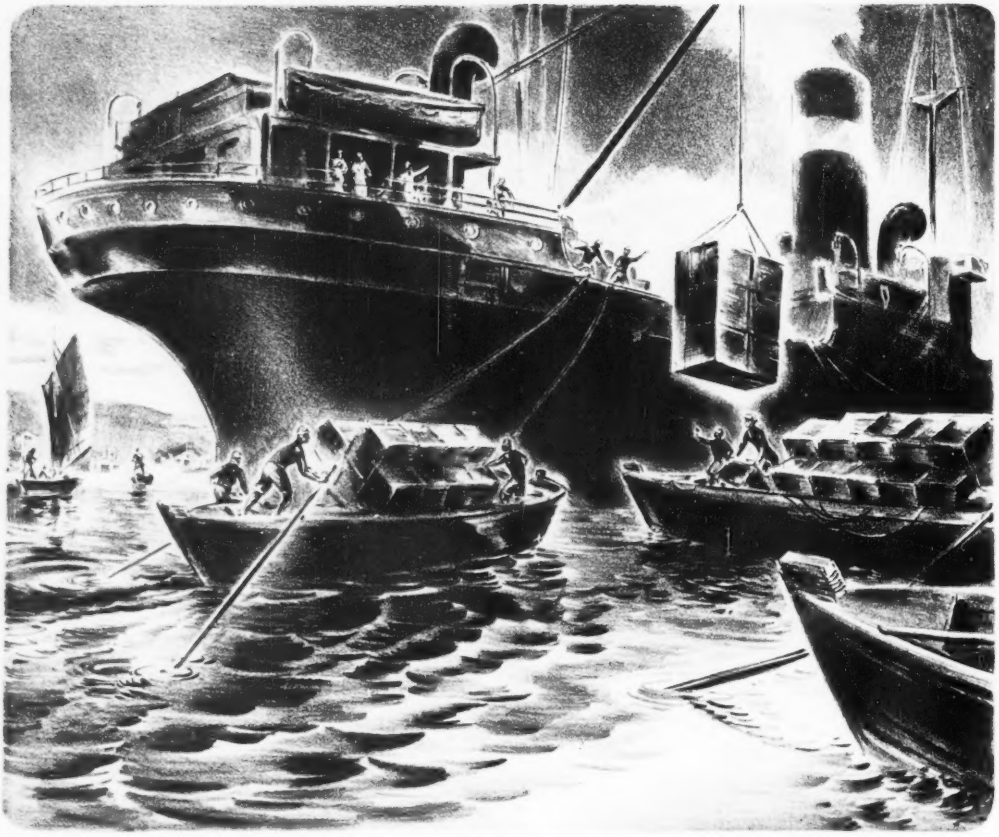

LOADING TEA IN CEYLON —AN ORIGINAL LITHOGRAPH BY HENRY E. WINZENREID

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Riegel **TAILOR-MADE PAPERS FOR PROTECTIVE PACKAGING**

the FDA, were: William Green, president of the AFL; James Carey, secretary-treasurer of the CIO; A. J. Hayes, president of the International Association of Machinists; Donald Montgomery, Washington representative, UAW-CIO, speaking for Walter Reuther; James Patton, president, National Farmers Union; J. T. Sanders, legislative representative of the National Grange; Helen Hall, president, National Association of Consumers; and Wallace J. Campbell, Washington representative of the Cooperative League of the USA.

In the past the labor organizations went whole hog with federal bureaucrats in getting any law on the books that would fetter industry. But it seems now labor's pig has been stuck. Among the breads to be "standardized" are co-op health breads and other co-op and labor-sponsored types of "enriched" products.

The feature of the proposed bread standard to which these organizations took most active exception is a proposal to limit the quantity of nutritious ingredients that can go into bread, both white and enriched.

The representatives of farm, labor, cooperative and consumer organizations were joined in the protest by several famous nutrition experts, including Dr. Leonard Maynard of the School of Nutrition of Cornell University, and Dr. Marion Pfund, of the New York State School of Home Economics at Cornell University.

Don't Count 'Em

Up to the time the picture was taken no one had found the courage to tell this Rhode Island Red that her performance was strictly love's labor lost. She was given the potatoes as feed out in Oakland, Calif., which just shows you how confused a Rhode Islander can get in California.

Check The VIKING "Sanitor"

The Pump with the FIELD-PROVED One-Piece "O"-Ring Seal

For over 2 years Viking's one-piece "O" ring rotary seal has proved itself in the field in Sanitor after Sanitor unit.

Look to the field-proved, simple and sanitary way of sealing your sanitary pumps.

Insist on the Viking Sanitor with its one-piece "O" ring seal. It's beyond the pioneering stage. Ask today for free bulletins D100E and E100E.

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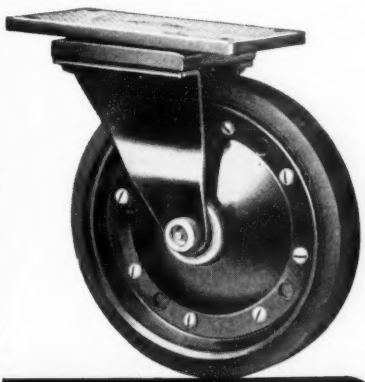
with Colson® CASTERS



Model 4-807-65 Swivel fork caster — ideal for medium weight industrial equipment

• No matter how modern or streamlined your truck fleet, it's no better than the wheels and casters it rolls on. Surprising—how a few dollars spent for Colson casters can increase the efficiency of hundreds or thousands of dollars worth of rolling stock. There's a Colson for every need—from light casters for office furniture to heavy-duty jobs of 1500 pounds capacity.

Colson also manufactures a wide range of trucks—hand trucks, platform trucks, box trucks, drum and barrel trucks and Lift-Jack Systems. Write us or consult your phone book (under "Casters" or "Trucks—Industrial") for the Colson representative near you.

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CASTERS • • LIFT JACK SYSTEMS • • INDUSTRIAL TRUCKS

Dairy Award

Arthur J. Good (left) president and general manager, Pickerington Creamery Co., receives the second Dairy Technology Award of Merit from Dean L. L. Rummell, Ohio State U., while I. A. Gould, chairman, dairy technology department, looks on. Ceremony took place on Ohio State campus in late November.

Holland Strawberry Pulp Imported by Canada

Victoria, B. C., center of an area famed for its strawberry growing industry, recently received a shipment of about eight tons of strawberry pulp from Holland for jam. Strawberry pulp has previously been shipped to British Columbia, but this is believed to have been the first shipment to packers in the Victoria district. The Dutch pulp, it is claimed, even with transportation costs, when allowing for saving on exchange, is about 25 per cent cheaper than B. C. prepared pulp.

The shipment which has now arrived at Victoria, was ordered in June, but was specified for delivery by a ship which would call direct at Victoria.

Packers on Vancouver Island will this year take delivery of blackberry pulp from Ireland, although no shipments will go to Victoria as packers there were unable to place orders in time. Shipments of black currant pulp from Tasmania have been coming to B. C. packers for the past three years.

Shrimp Output Doubled During Past Year

Millions of Americans are developing the shrimp-eating habit. Production and imports of this sea food during the 1950 season hit an all time high.

According to figures released by the U. S. Fish & Wildlife Service, covering the first nine months of the 1950 season, Alabama shrimp production was up 60 percent, Mississippi up 65 percent, and Louisiana up 17 percent. In Texas shrimp production rose over 100 percent. In Key West, after the discovery of the pinks, production rose in 6 months from zero to 15,000,000 lbs.

Imports from Mexico are up 8,000,000 lb. and Panama has increased shipments to the U. S. There has even been a token shipment recently from Greenland of cherry red shrimp.

Canners Seek to Clairfy The NPA Tin Cutback

National Production Authority tin order is across-board cutback at fabricators level, to 100 percent of first half of 1950 consumption in January, 80 percent in February and March. No exemptions, no special consideration. Only provision for "hardship cases" is same as in previous orders on other metals—you can ask NPA for adjustment if you feel you're hurt unfairly.

National Canners Association expects NPA to spell out orders before Feb. 1, probably by issuing end use limitations. Canners Association looks for gradual return to something like wartime order M-81. They say you can't get the 20 percent by cutting plant specials alone—some uses probably will be banned. They don't expect pack of perishable items to be affected, since it wasn't during war. Limits on can size may come before ban on items like dog food and oil. The tougher the cutbacks get after March, the more regulations of this type; and tougher cutbacks are now being hinted at by NPA.

No sign of impending price controls. Economic stabilization agency is going after steel, copper, lead and zinc, first. They aren't talking about tin now, but it will probably be in second wave of price-wage orders on basic metals.

Chicago QM Packages Millionth C Ration

Two weeks ahead of schedule the 1,000,000th package of C Rations coasted off the "pilot" assembly line for packaging combat rations at the Chicago Quartermaster Depot. Packaging of the C-6 Ration was begun at the depot, commanded by Brig. Gen. Everett Busch, early in September with a target date of mid-November for the millionth ration assembled. Actually, the first million packages were completed by Nov. 3.

Working under pressure the pilot assembly line was expanded to meet ration requirements until the food industry could assume the major task of packaging combat rations. The "pilot" line is maintained permanently by the Chicago Quartermaster Depot for purposes of cost control and ration research and development. A basic ration for fighting men, the C Ration may be eaten cold or may be heated by the individual soldier. One complete ration supplies a well-rounded nutritious set of meals for an entire day.

Output of the assembly line is 70 complete rations per minute with six different menus as called for in the general specifications of the C Ration. The six menus include meats and vegetables, fruits, crackers, cookies, jam, soluble coffee, sweet chocolate, and a host of minor items such as chewing gum, soap, toilet paper, water purification tablets, cigarettes, matches, small can opener and a waterproof pliofilm bag.

Institute Urges Program To Up Butter Market

Aid in the solution of some general problems confronting their communities, increased proficiency in industrial relations, continuation of cream improvement program, and further improvement in advertising, selling and merchandising methods were cited to members of the American Butter Institute attending its 42nd Annual Meeting in Chicago, to be answers to "What's Ahead for Butter?" the major theme of the meeting.

President G. L. Ogle urged: (1) Opening of butter-making plants to public visitation as centers of initiative and examples of the workings of the free enterprise system; (2) attention to

job rating, job analysis, employee training, and similar factors in industrial management as means of obtaining improved efficiency and good employee relations; (3) adoption of four-day delivery plan for cream as an aid in obtaining and maintaining uniform high standard of quality in butter; and (4) participation in the public relations program of the dairy industry to build local and national good will for butter and to increase the public demand for it through educational media, advertising, and sales aids to retailers.

Preston Richards, director, dairy branch, Production & Marketing Administration, said present indications show little change in milk production during 1951. The number of milk cows has been about the same for two years, and the carryover of feeds plus the 1950 crops provide a near-record supply of feed grains per animal and an all-time high supply of hay per animal. He thought there was a possibility of substantial changes in the production of individual dairy products during 1951 with increased demand being greatest for fluid milk and ice cream. Tonnage of butter made in 1951 is expected to be significantly less than in 1950.

This outlook for 1951 is not resulting in a slackening of the USDA Production & Marketing Administration's efforts to dispose of the present price-support inventories of dairy products. Perishability of these stored inventories is being taken into account. Disposal of 42,000,000 lb. of 1949 butter is one of the most pressing problems. Ninety-

Mostly Sugar Plant

Imperial Sugar Co.'s new seven-story plant at Sugar Land, Tex., got its picture took before it was fully dressed. That's why two of the three vacuum pans are showing. If you look closely you can pick out the vacuum pans by their "eye glass port holes," installed to check the level of the syrup. Space at extreme right is for the third pan.

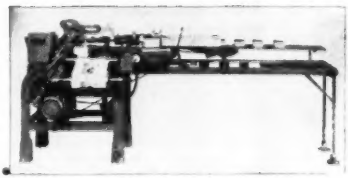
AUTOMATIC WRAPPING

Packers everywhere, when they take the time to investigate, like the labor-saving features of Hayssen Automatic Wrapping Machines. Low initial cost, mechanically simple, dependable under pressure, Hayssens keep the wrapping cost at a low level. Accurate registration of printed overwraps is controlled by the Hayssen Electric Eye—and practically any type of wrapping material may be use. For complete information on the many Hayssen models—wrapping machines backed by more than 40 years' experience—write to the factory. Inquiries are welcome.

HAYSSEN MFG. COMPANY • SHEBOYGAN, WIS.

Hayssen
ELECTRIC EYE WRAPPING MACHINES

IT PAYS TO WRAP
THE HAYSSEN WAY



Imagine your dog's delight on seeing a solid column of biscuits 160' long and 42" wide! That's the carrying surface of this Cambridge Woven Wire Conveyor Belt in a recirculating oven at Kendall Foods Company, Bell Gardens, California.

Balanced Weave, specified for this installation, is low in cost, eliminates creeping of the belt on the drive pulley, and provides high tensile strength. Open mesh of the belt allows free circulation of heat within the oven . . . crumbs and broken bits of biscuit fall through the belt, cannot foul up automatic packaging equipment at the end of the oven.

Whether you're baking biscuits, processing meat or canning vegetables, there's a Cambridge Woven Wire Conveyor Belt to help mechanize your production. Stainless steel to meet sanitary codes is a standard material of construction for our food plant customers. Call in your Cambridge field engineer today, let him explain the superior construction features of . . .

Cambridge Woven Wire Conveyor Belts

WRITE FOR FREE MANUAL illustrating and describing conveyor belt installations for food, metal-working, chemical, ceramic and other processes.

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WIRE CLOTH | METAL CONVEYOR BELTS | SPECIAL METAL FABRICATIONS

OFFICES IN PRINCIPAL INDUSTRIAL CITIES
See "Belting - Mechanical" in your Classified Telephone Directory.

Cold Enough!

Holding temperatures at —10 to —15 deg. F., this newly built Los Angeles warehouse will be used largely for storage of concentrated frozen citrus. It has a capacity of 3,000 tons. A duct system running along the ceiling evenly distributes the —12 deg. air through the 275x49x19-ft. area. Double flapper doors protect exits.

seven percent of the other 16,000,000 lb. of 1949 butter scored U. S. Grade B or better when inspected in August. Dispositions of 1949 and 1950 butter through Nov. 3, 1950, totaled 93,500,000 lb., leaving a total of 149,000,000 lb. in stock. If production of butter during the current winter season is as much as 10 percent below that of last winter, 50,000,000 lb. of government stocks may go back into trade channels this winter.

All of the cheddar cheese acquired in 1949 had been disposed of, leaving on hand 43,000,000 lb. of 1950 cheese. Inventory of nonfat dry milk solids totaled 200,000,000 lb. as of Nov. 3, 1950.

Richards stated that the USDA will continue to be under mandate to support milk and butter-fat prices at 75 to 90 percent of parity by the purchase of dairy products until March 31, unless existing legislation is changed or modified.

More Compulsory Dating Seen For Frozen Food

Compulsory dating of frozen food is on the increase. More and more municipal public health ordinances provide that frozen food must bear the name of the product, the processor's name and address, and the date when processed or wrapped. The date may be in code.

Wholesalers find that when a processor omits the code from the package they are prevented from selling in areas where such laws are in effect.

Food & Drug Administration feels that the coding laws may be of benefit to the industry since coding makes it possible to condemn only a small part, rather than the entire shipment, of goods seized for violation of pure food laws. Since it makes F&DA enforcement easier, the government agency is reported encouraging this type of legislation.

No Early Increase Seen In Pepper Supplies

Americans who like liberal sprinkling of pepper over their meals, will have to go easy, as long as Indonesia—world's chief producer of the two pepper-varieties—cannot bring back its production to the prewar level. This may be the case in 1952, but more likely it will be 1953, before any appreciable production of pepper will be available for export in Indonesia, experts said recently.

The present world-scarcity of both white and black pepper—the latter being best liked for table-use in America—is not an artificial one. Pepper as a commodity has so far failed to recover from the damage and destruction caused by the Pacific war, when the main production areas with the exception of Malebar in India, were overrun by the Japanese. Pepper is almost exclusively a product of the Far East and is cultivated in Indonesia—on the islands of Sumatra, Banka and to a smaller extent also on Java—Sarawak (in Northern Borneo), Siam and French-Indo-China. Of all those areas, more or less peaceful conditions and economic stability has returned only to Sarawak and Siam. French-Indo-

China is still the battleground between democracy and communism. Indonesia by far the largest prewar producer is slowly recovering from the after-effects of a destructive and costly revolution against Dutch colonial rule.

"Reefer" Cars Adequate Say Rail Operators

Following a recent blast by the Department of Agriculture's Production & Marketing Administration at the refrigerator car lines for not improving their equipment for carrying frozen foods, the rail lines have come back with a denial.

In fact, the railroads and refrigerator car companies claim they are not lagging behind in providing transportation needs of the frozen food industry. Says one car operator:

"We have not only kept pace with the rapid growth of the industry, but have made that growth possible by providing means of accomplishing the present wide distribution of frozen goods throughout the country."

The USDA claims that there are "still very few cars available that are so insulated and refrigerated that they can hold low freezer temperatures. Consequently, long-distance rail shipments of frozen foods are at a temperature considerably above zero Fahrenheit."

USDA researchers recently followed a shipment of frozen food from Oregon to New York and kept a careful log of time and temperature. On a number of occasions, while the cars stood on the siding awaiting clearance, (and the wheel-actuated fans were not working) the temperature in the cars rose above the recommended high limit.

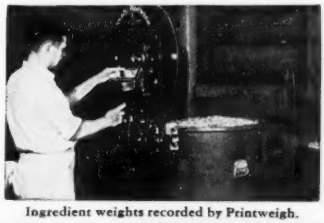
The supply of refrigerator cars generally has been adequate during the summer months of 1950, but a tight car supply and some shortages have developed in certain areas in recent months. However, in the event of any substantial increase in reefer loadings or major dislocation of available cars, serious shortages would be likely.

At the beginning of World War II, railroads and private car lines owned a total of approximately 146,000 refrigerator cars. By the end of the War the number had declined to approximately 138,500. Although more than 25,000 new cars have been built since that time, the installation of new equipment has not kept pace with retirements. As of Aug. 1, 1950, the number had further declined to about 130,000.

And, only about 22,000 of these refrigerator cars are of the modern heavily-insulated type designed to maintain low temperatures in transit, and thus suitable for frozen foods.

PRINTWEIGH STOPS ERRORS

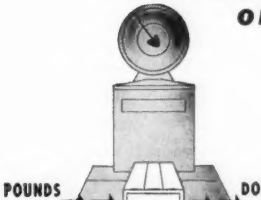
For closer cost control in food industries — Toledo Printweigh Scales provide printed weight records . . . assure you that the accurate indication of the Toledo dial will reach your accounting records without chance of human error. Prints big, clear figures . . . on thick tickets . . . on large or small sheets . . . on strips . . . with extra copies. Saves time, stops losses and improves product-quality throughout your food plant—for receiving, batching, ingredient weighing, packaging, shipping or other weighing operations.



Ingredient weights recorded by Printweigh.

Accurate printed records provided by Toledo Motor Truck Sales.

FOOD becomes MONEY on your SCALES!



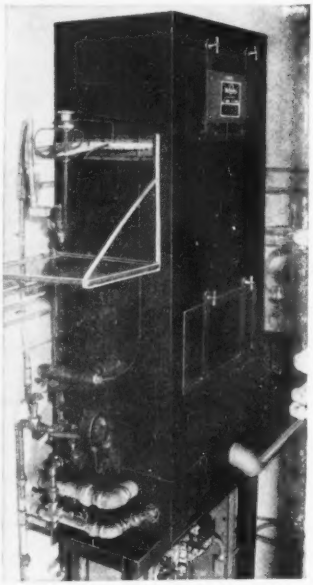
Errors made at the scale stay wrong forever. There is no chance to recheck; either the food product has been shipped or has lost its identity in the general stock. You've got to be *right*—weigh it right—Toledo Printweigh means *accurate* weights *accurately* recorded! Send for bulletin 2021 on modern weight control. Toledo Scale Company, Toledo 1, Ohio.

Guard Costs with

TOLEDO *All the Way*

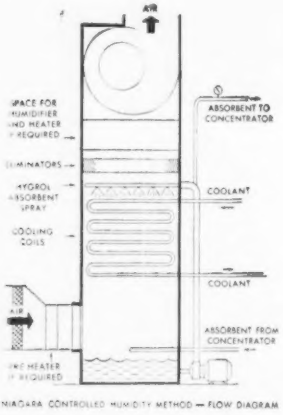
New "Controlled Humidity" Method Gives a Better Solution to Air Conditioning Problems

"Hygrol" Absorbent Liquid Dehumidifies Fresh Air Without Refrigeration



NIAGARA Air Conditioners or Dehumidifiers using "Hygrol" liquid absorbent give precise control of air temperature and humidity... at lower operating cost, with large savings in space and with smaller and less expensive equipment, in many applications.

This method dehumidifies the air by passing it through a chamber in which "Hygrol" spray removes its moisture and produces a low dew point. The "Hygrol" solution resulting is continuously and automatically re-concentrated, providing always full capacity in air conditioning and assuring always a constant dehumidifying capacity and a trustworthy, constant condition for your material, apparatus, process or room to be conditioned.



NIAGARA CONTROLLED HUMIDITY METHOD — FLOW DIAGRAM

"Hygrol" is a liquid, not a salt solution; it stays pure and non-corrosive; it does not cause maintenance or operating troubles in food plants or in chemical processes.

Investigate this new Niagara Method for "comfort" air conditioning as well as to protect quality in hygroscopic material, or processes or instruments, or to prevent condensation damage to metals, parts or products.

Write for Bulletin 112

NIAGARA BLOWER COMPANY

Over 35 Years Service in Industrial Air Engineering

Dept. FI, 405 Lexington Ave. **New York 17, N. Y.**

Experienced District Engineers in all Principal Cities

Frozen Citrus Delivered With Other Products

Two altered patterns of distribution for citrus concentrates came into evidence recently, one involving the Minute Maid Corp., the other the Florida Citrus Exchange.

In the former case, it was revealed that Minute Maid distributors of Long Island, West Chester and Manhattan will also distribute Blue Bonnet margarine and Fleischmann's yeast, thus tying in with products of Standard Brands in those areas. Minute Maid will do the distributing of the three products direct from its fleet of refrigerated trucks to retail stores, relying on the greater volume to cut costs materially.

Florida Citrus Exchange will distribute its products under the label of Foremost Dairies, Inc. Distribution was to start soon after the first of the year, beginning with present Foremost outlets in the Southeast, and Texas. It is scheduled to go on a national basis later.

Higher Coffee Prices For Next 2 Years

UN Food & Agriculture Organization officials predict higher prices for coffee during next two years. Here's why:

World production of coffee in 1950-51 is expected to be below that of 1949-50. This fact, coupled with increased coffee drinking, and the fact that Brazilian reserves have been exhausted will put coffee at a premium. Recent demands have been met from Brazilian government reserves.

FAO predicts 1950 world imports of coffee will show a decline of 5 to 10 percent, and U. S. imports a decline of 10 percent below 1949.

The outlook for 1951-52 doesn't look promising, although African output is expected to be up about 20 percent over the 1949-50 yield. But higher military demands will obliterate this gain.

New Can Plant

American Can Co. plans to build a new plant at Stockton, Calif., with a capacity of 350,000,000 containers annually.

The plant will cost "several million dollars," and will be completed and placed in full operation before the end of 1951, C. W. Roberts, vice president in charge of the company's Pacific division, said. At peak production, the plant will employ 500 persons.

The 125,000-sq. ft., one-story steel and concrete structure will be located on a 40-acre site with sidings on both

the Western Pacific and Southern Pacific railroads. The site will give ample room for future expansion, Roberts pointed out.

Being built primarily to supply container requirements of the fruit and vegetable canners in or near Stockton, the plant will free present facilities at San Jose and Sacramento for the expanding industry in those areas.

Brewers' Safety Program Is Showing Results

An industry-wide brewing safety program is credited with cutting accident rates to an all-time low during the first six months of 1950.

The industry's average number of work injuries for each 1,000,000 employee-hours dropped from the 1949 figure of 28.4 to 21.6 for the first half of this year, according to Edward V. Lahey, president and chairman of the United States Brewers Foundation. The figures are based on preliminary statistics covering 95 percent of the brewing industry's production, gathered and compiled by the Foundation's Employee Relations division.

Mr. Lahey said that brewers were among those recently cited by the U. S. Bureau of Labor Statistics as showing a "marked decrease in their injury-frequency rates" between 1948 and 1949. The same government report showed that the brewing industry has experienced the second largest drop of any industry in accident rate since 1946.

Stroud Jordan Award

Nominations for the first Stroud Jordan Award are still open, according to the award committee chairman.

This award, in the form of a medal, is to be given for an outstanding contribution to the field of candy technology. Made possible by the American Sugar Refining Co., the award is being supervised by the American Association of Candy Technologists.

Nominations will be accepted until February 1. All correspondence should be addressed to the chairman, Prof. Katheryn E. Langwill, Drexel Institute of Technology, 32nd & Chestnut Sts., Philadelphia 4.

Surplus Food Concern

There is "growing concern" in agricultural circles in Holland at the way the U. S. is seeking to dispose of surplus food stocks by selling them at reduced prices to other nations, a spokesman of the Dutch Agricultural Department said recently. Holland recently

BEFORE and AFTER

or how PNEU-VAC

THE MODERN AIR CONVEYOR SYSTEM

Pneu-Vac Pipeline replaces cumbersome wooden bucket elevator at Megs Macaroni Plant.

speeds bulk materials handling

eliminates contamination saves time, labor space and money

FLEXIBILITY of Pneu-Vac installation is illustrated by vertical and horizontal pipes connected with long sweep elbow. Old elevator system is shown in background.

With a flexible, easily installed Pneu-Vac System the Megs Macaroni Company of Harrisburg, Pa. has completely modernized its bulk flour handling . . . stepping up efficiency and assuring the ultimate in sanitation!

Bulk flour is stored in bins from which it is drawn in correct percentages for rebolting. Sifter eliminates all foreign materials. Here the Pneu-Vac System takes over and swiftly transports the rebolted flour to the noodle machine. Flour is pneumatically conveyed at the rate of 5000 ft./min. over a vertical lift of about 50 ft. and a horizontal run of 48 ft.

The Pneu-Vac System is automatically swept clean after each batch cycle. Because transported material cannot lodge at any point, insect infestation is completely abolished.

If you have a bulk materials handling problem involving powdered, granulated, flaked, grated, crushed, pelleted or other similar material, Pneu-Vac provides an efficient solution. Write today for Bulletin 18C to Sprout, Waldron & Co., Inc., 35 Waldron St., Muncy, Penna.

168

LOOK TO SPROUT-WALDRON for BETTER PROCESSING EQUIPMENT

Sprout-Waldron

Manufacturing Engineers

SINCE 1865

MUNCY • PENNSYLVANIA

Another Leader in the Coffee Industry chooses CONSOLIDATED *High Speed* COFFEE UNITS

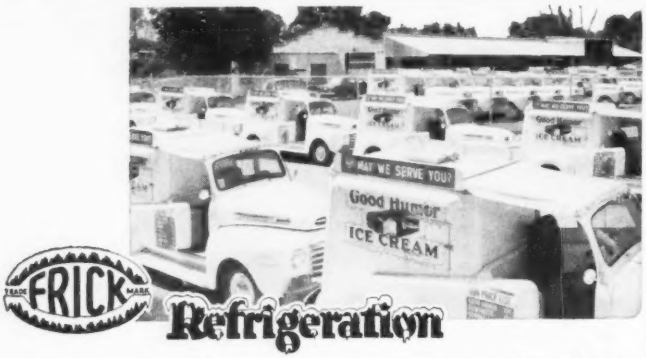
● Consolidated Type 45-C-10 High Speed Coffee Weighing Units with 10-head scale fill, weigh and settle 100 ½, 1 or 2 lb. cans, jars or cartons per minute. Progressive packers, like the Old Judge Coffee Company, use the C-10.

Convevor is equipped with vibrating settler and package control. Scale weighs to an accuracy of 1/16 oz. over or under. Once machine is set, operation is fully automatic.

The Consolidated C-10 handles the full range of coffee grinds... drip, percolator, regular, silex and steel-cut. Write for information on Consolidated machines for the food industry.

CAPEM Screw Cappers SEALTITE Bag Sealers HOEPNER Bag Sewers

CONSOLIDATED PACKAGING MACHINERY CORP.
1400 WEST AVENUE · BUFFALO, NEW YORK



FRICK Refrigeration

Holds temperatures 18 degrees below zero in the new storage from which the Helned Corporation distributes Good Humor Ice Cream in Philadelphia. Fifty trucks are served by this storage. Installation by the Mack Machine Co. of Pennsylvania, Philadelphia Distributors for Frick Air Conditioning and Refrigeration.

Frick Refrigerating Unit in Service at Helned Corp., Philadelphia

The leaders buy Frick equipment because it is DEPENDABLE. Let us quote on your cooling needs.

DEPENDABLE REFRIGERATION SINCE 1882
FRICK CO.
WAYNESBORO, PENNA. U.S.A.
Also Builders of Power Farming and Sawmill Machinery

brought this matter to the attention of the Food & Agricultural Organization (FAO) Conference meeting in Washington, he added, and it is hoped that "something will be done about it."

Holland's chief concern at present is the large stock of cheddar cheese sold to Great Britain at a price considerably below that of Dutch cheese. "No official protest has yet been made," the spokesman said, "as the present position is not serious, but the policy is regarded here as potentially dangerous for normal trade in agricultural products, especially regarding future trade agreements."

Corrections

In the article, "WRRL 'Puffs' Potatoes" (p. 45, Nov. '50 FI), an important decimal point was omitted, through typographical error, from a figure appearing in the first paragraph of the text's continuation on p. 178. It is stated that non-water-soluble materials were suspended " . . . in 15 percent starch solution," whereas this should have read "1.5 percent."

Attention is also called to a mistake carried over from the initial manuscript into the article, "Vacuum Treatment Curbs Browning of Apple Slices" (p. 64, Sept. '50 FI). Final sentence in the next to last paragraph should read, "However, it does cost 0.2c. to 0.3c. more per pound to produce." Incorrectly, the figures were given as "2c. to 3c."

F&DA Food Standards

Status of food standards of Food & Drug Administration in early December is reviewed below.

Policy Statement

Pasteurized process cheese and related foods, labeling requires that precise names for recently standardized foods appear on the label, with equal prominence for all words in name. Names of optional ingredients must not have greater prominence than the name of the product, and when a manufacturer elects to declare fat and moisture content, these must be "on the basis of the food as marketed".

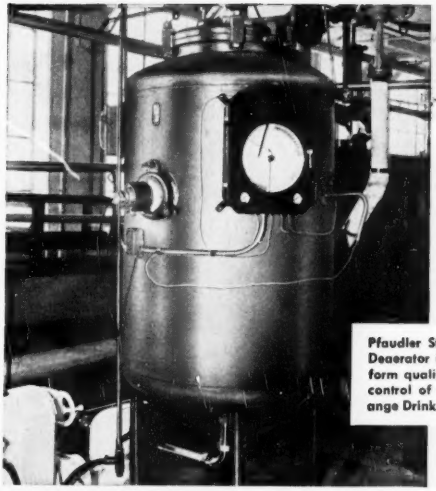
Future Hearings

1. *Ice Cream*, new, standard of identity. Resumed prewar hearing, scheduled to begin Jan. 8; expected to be lengthy because of large number of potentially controversial subjects that require exploration.

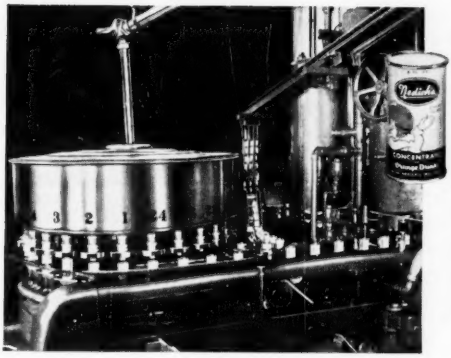
2. *Preserves, jellies*, and *fruit butters*, amendments, standards of identity. Scheduled to begin Jan. 2, to set 25 percent as the upper limit for corn

How Pfaudler Equipment Aids Nedicks

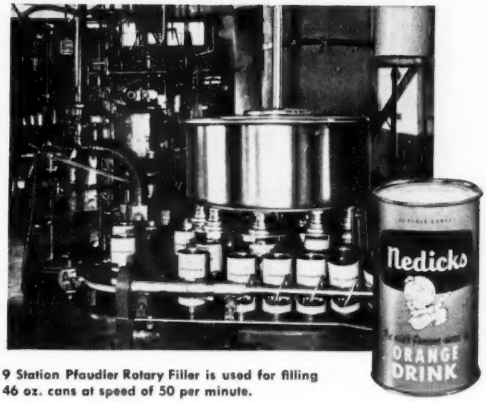
to process quality orange drink



Pfaudler Stainless Steel Deaerator is key to uniform quality and flavor control of Nedick's Orange Drink.



24 Station Pfaudler Rotary Filler where 6 oz. cans are filled at a rate up to 400 per minute.



9 Station Pfaudler Rotary Filler is used for filling 46 oz. cans at speed of 50 per minute.

Nedick's is a famous name in orange drinks, and by producing a *uniformly* good quality of orange concentrate, demand has increased phenomenally. How do they do it? The answer—fast processing!

This orange product, like all citrus juices, is quick to oxidize. Nobody wants your product after that. With the aid of a Pfaudler deaerator in combination with Pfaudler High-Speed Rotary Fillers, Nedick's has solved the problem of oxidation.

The deaerator removes the air which is so detrimental to flavor and keeping quality, just before the product is canned. A constant vacuum is maintained as juice flows through the unit. According to Mr. E. S. Hansen, Production Manager of Nedick's, ". . . tests for residual air content in the product demonstrate efficient deaeration." Result—good flavor.

Speed of handling is also essential—the reason why Nedick's uses one 9 Station Pfaudler Filler for handling 46 oz. cans and one 24 station machine for filling 6 oz. cans. These machines are noted for their speed as well as their accurate and clean fill. When you can pack as good a product as Nedick's Orange Drink base day after day, isn't it good proof of the profitability of using Pfaudler equipment and process know-how? Check for yourself. Use the coupon.

Pfaudler

THE PFAUDLER CO., ROCHESTER 3, NEW YORK
Engineers and Fabricators of Food Processing Equipment

GLASS-LINED STEEL
Hastelloy—Aluminum
Tantalum—Carbon Steel
Solid or Clad Stainless Steel
Nickel, Inconel, Monel

THE PFAUDLER CO., Dept. FI-1, Rochester 3, N. Y.

Please send me more information about:
☐ Pfaudler Deaerators, ☐ Pfaudler Rotary Can Fillers.

Name_____

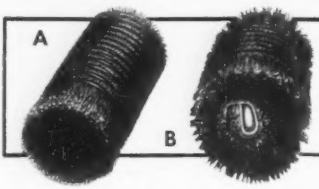
Company_____

Address_____

City_____ Zone____ State_____

New Brush Cleans 119,600 Ham Molds

New FULLERGRIPT All-Nylon Ham Mold Brush Shows 30 to 1 Increase in Brush Life

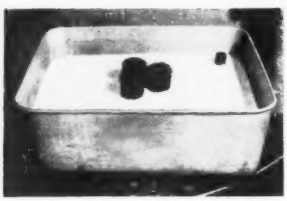


(A) A Fullergript nylon ham mold brush before using.

(B) A similar brush after it had cleaned 119,600 molds.

The problem at The Cudahy Packing Company plant in New York was to secure a ham mold brush with a long service life and enough flexibility for quick but thorough cleaning. Previously brushes had lasted just two days. Other brushes with enough density for longer life were so stiff that they slowed down the operator passing the molds over the brush.

Then Cudahy installed Fullergript all-nylon brushes. The results show a 30 to 1 increase in brush life over the brushes previously used. The heavy loading of nylon made possible by the unique Fullergript construction is the reason for this exceptionally long service. And despite the density of the filler, the properties of



nylon give the brush the flexibility required for fast cleaning.

Here is a new cost-saving brush that it will pay all meat packers to investigate. There are similar production economies available to other branches of the food industry with Fullergript power brushes. To learn how Fullergript can help cut *your* costs, simply write to . . .

FULLERGRIPT — The FULLER BRUSH CO.

INDUSTRIAL DIVISION
3641 MAIN STREET
HARTFORD 2, CONN.

No Squashed Squash Here

But how would you like the job of taking inventory? Because temperature must be carefully controlled, this greenhouse in Concord, Mass., proves an ideal storage room. (Wide World)

sweetener solids content and eliminate present label declaration. Upper limits now 50 percent for preserves and jellies, 100 percent for fruit butters, with label declaration required. If amendment adopted, as asked by industry, standards would be in harmony with those for canned fruits (in regard to sweetener policy of F&DA).

3. *Margarine*, amendments. Hearing requested by industry; to accept name "Margarine", to permit use of additives for flavor stability, to raise vitamin A minimum content, and to specify method of vitamin analysis.

4. *Evaporated milk*, amendment. Hearing announcement rumored; would raise vitamin D content and would specify method of vitamin analysis.

Hearings in Progress

None.

Tentative Orders Awaited

1. *Canned mushrooms*, amendment, standards of identity and fill. Expected soon; hearing adjourned in June 1950, briefs filed in July.

2. *Residue tolerances*, on fresh fruits and vegetables; new. Not expected soon; briefs could be filed until Dec. 15.

Final Orders Awaited

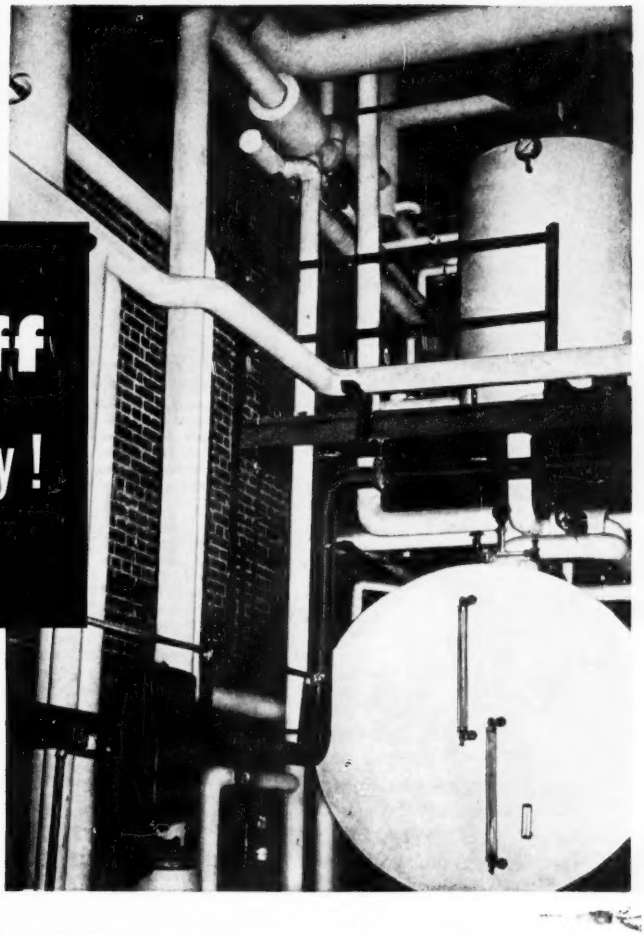
1. *Canned corn*, amendment, standards of identity, quality, and fill. Expected soon; tentative order published in April 1950, exceptions filed in May.

2. *Cream cheese with (and) other foods; Neufchatel cheese spread with (and) other foods*, new, standards of identity. Expected soon.

3. *Bread*, new, standard of identity. Expected soon; requests for reopened hearing, received in November, were

Insulation Contractor:
Guy M. Beaty & Co.
Charlotte, N. C.

Hot stuff kept that way!



How United States Plywood Corporation conserves steam—cuts heating costs—with K & M "Featherweight"® 85% Magnesia Insulation

The production of the United States Plywood Corporation's famous *Craftsman's grade* of Weldwood Plywood calls for steam—and plenty of it. In the photo above, you see the Deaerating Feed Water Heater and the Condensate Tank in U.S. Plywood's Orangeburg, S.C., plant. And you can see how K&M "Featherweight" 85% Magnesia Insulation has been applied to these heating units, as well as to the lead lines and pipes of the steam system. Throughout this entire plant, "Featherweight" 85% Magnesia is on the job conserving steam in lines and equipment; keeping heating costs down.

K&M "Featherweight" Insulation has been doing jobs like this for more than 60 years—under every conceivable installation condition. In factories, power plants, oil refineries, chemical plants, hospitals, steamships—wherever exacting steam temperatures must be maintained—you'll find "Featherweight" 85% Magnesia.

This highly efficient insulation combines basic carbonate of magnesia with asbestos fibers—is light-weight, strong, fire-proof—time-proved for all steam temperatures up to 600° F. Ask your local Keasbey & Mattison Distributor for complete information; or, write us direct.

Nature made Asbestos . . . Keasbey & Mattison has made it serve mankind since 1873

KEASBEY & MATTISON
COMPANY • AMBLER • PENNSYLVANIA

REGAN

CASE HISTORY:

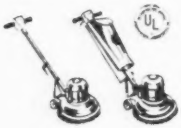
REGAN BROS. BAKERY

Minneapolis, Minnesota

J. B. JASSOY, Manager, *reporting:*

The wrapping room floor is subjected to continual foot and truck traffic, yet 10 months after application of Multi-Clean Bakery Floor Preserver, the surface retains its hard, lustrous finish, and maintenance is simple and inexpensive.

Mr. Jassoy's report ten months after the wood floors in this high production bakery were treated with Multi-Clean Bakery Floor Preserver and the Multi-Clean Method gives dramatic proof of results obtained. Multi-Clean Bakery Floor Preserver is specially formulated for wooden floors in the food processing industry; the application is swift and easy; rapid drying makes the floor ready for traffic in 90 minutes after application.



MULTI-CLEAN BAKERY FLOOR PRESERVER'S complete sealing action keeps floors sanitary by closing cracks and crevices against dirt and infestation, resisting growth of mold and other bacteria. On the floor's surface, it has remarkable resistance to fats, oils, water, sugars and alkalies, and provides a hard, lustrous, non-slip finish.

ORDINARY DRY SWEEPING KEEPS FLOORS CLEAN, since spillage of raisins and other sticky products does not adhere to the surface. Weekly damp mopping completes all other cleaning requirements. Occasional steel wooling with a Multi-Clean Floor Machine maintains the floor's lustre. With all these advantages, the cost of Multi-Clean Bakery Floor Preserver per square foot, per coat, is less than one cent a year. Upkeep expense is correspondingly low.

FREE! This case history, complete with cost figures is available to you without cost. Also, to help you solve your floor problems ask for our free reference manuals on all types of floors.

MULTI-CLEAN PRODUCTS, INC.
2277 Ford Parkway, Dept. 35B
St. Paul 1, Minnesota

MULTI-CLEAN
PRODUCTS, INC.

Gentlemen: Send me this case history on Bakery Floor Preserver and also the floor maintenance manuals I have checked.

☐ LINOLEUM ☐ ASPHALT TILE
☐ TERRAZZO ☐ RUBBER TILE
☐ CONCRETE ☐ WOOD

Name_____
Address_____
City_____ Zone____ State_____

Custom Cleaning Chemicals • Floor and Rug Machines • Permanent Floor Finishes • Industrial Vacuums

not granted, effort being made to issue final order as soon as possible.

4. *Frozen fruits*, new, standards of identity and fill. Not expected soon; exceptions could be filed until Jan. 2, an extension having been granted after first deadline (Nov. 18), by order on p. 8089 of Nov. 25 *Federal Register*.

Standards Completed

None since last reported. (FOOD INDUSTRIES, Oct. '50, p. 147.)

USDA Grade Standards

Recent actions by Production & Marketing Administration on U. S. Grade Standards and related activities include the following:

Cheddar Cheese, second revision, p. 8233, Dec. 2 *Federal Register*, effective Jan. 1.

Carcass beef, revised, p. 8150, Nov. 29 *Federal Register*, effective Dec. 29.

Slaughter Cattle, revised, proposed, p. 8166, Nov. 29 *Federal Register*, written comments received until Dec. 29.

Schedule of Events

January

8–10—Michigan State College, annual processors' fieldmen's conference; School of Agriculture, East Lansing, Mich.

15–18—American Society of Mechanical Engineers and Society for Advancement of Management, plant maintenance conference and show; Auditorium, Cleveland.

22–26—American Society of Heating & Ventilating Engineers, 10th international exposition; Commercial Museum, Philadelphia.

30–31—National Dairy Council, annual meeting; Hotel President, Kansas City, Mo.

February

5–10—Oregon State College, 30th annual canners' and freezers' school; Corvallis, Ore.

11—National Egg Products Assn., annual meeting; Auditorium, Kansas City, Mo.

11–13—Institute of American Poultry Industries, fact finding conference; Municipal Auditorium, Kansas City, Mo.

17—Peanut Butter Manufacturers Institute, annual meeting; Morrison Hotel, Chicago.

17–25—National Canners Assn. in conjunction with National Food Brokers Assn. and Canning Machinery & Supplies Assn.; Stevens Hotel, Chicago.

21–23—Purdue University, 6th industrial waste conference; Lafayette, Ind.

27–Mar. 2—National Assn. of Frozen Food Packers, et al., frozen food industry convention; St. Francis Hotel, San Francisco.

March

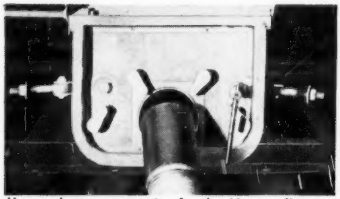
5–8—American Society of Bakery Engineers, 27th annual meeting; Edgewater Beach Hotel, Chicago.

27–29—University of Wisconsin, dairy manufacturers conference; College of Agriculture, Madison, Wis. —*End*

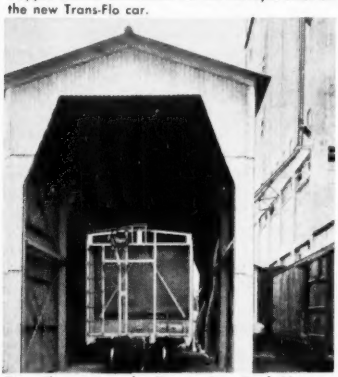
Handling flour in bulk

outmodes all other methods

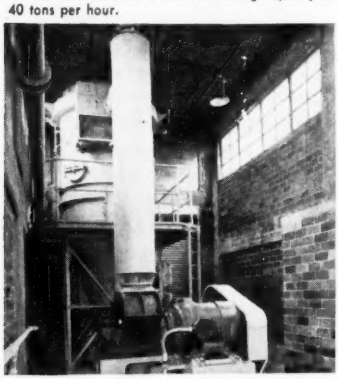
IT'S ECONOMICAL—SAFE—SANITARY



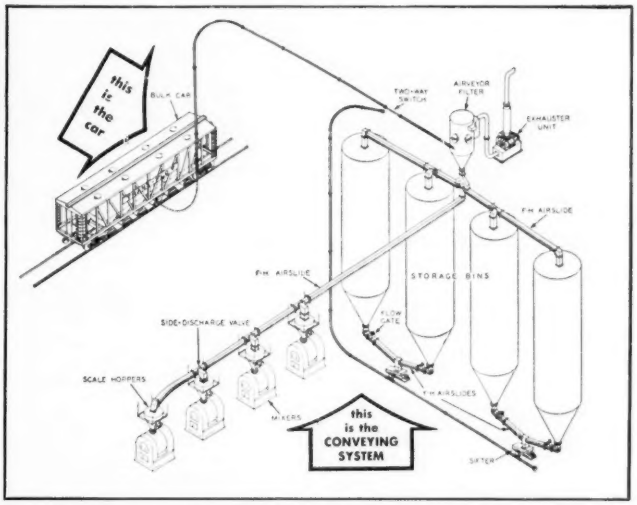
Hopper bottom connection for the Airveyor lines on the new Trans-Flo car.



Trans-Flo car in unloading station. Dual Airveyor conveying lines pass through shed wall and continue up the side of the building to storage or to mixers. Each has a capacity of 20 tons per hour, can be combined for a total unloading capacity of 40 tons per hour.



Airveyor filter type receiver, exhauster and motor assembly in foreground. This is the power supply of the Airveyor system, furnishing a continuous flow which draws flour from the car into the self-cleaning filter. Filter discharges into storage or process bins through a rotary air lock.



Typical Fuller System which uses the Airveyor for unloading flour from the Trans-Flo car to storage bins and the Airslide to reclaim it from storage to mixers in the bakery.

Cooperating with General American Transportation Corp., Fuller has developed a new method of bulk handling of dry pulverized and granular food ingredients . . . in-transit and in-plant. It meets all sanitary requirements of Federal, State and Municipal Agencies — it reduces unloading and conveying time—keeps infestation at the minimum.

Handling at the mill, in-transit and in-process is cleaner and more sanitary. There's no dusting. It's more economical because bags and barrels are eliminated as well as transportation of this tare; man hours are cut; there's no material waste.

Other than the blower and feeder, there are few moving parts; maintenance is reduced, reliability improved. Sharp turns and pockets where flour or similar products might accumulate and infestation occur are eliminated. The system can be blown completely free of all lading. Retention of all visible dust is assured. The only power needed is a source of low pressure air.

It will pay you to investigate the possibilities of pneumatic foodstuff handling in your plant. It improves quality, it's economical, efficient, safe and sanitary. A letter will bring a Fuller Engineer who will analyze your present conveying systems without obligation to you.

FULLER COMPANY, Catasauqua, Pennsylvania
Chicago 3 — 120 So. LaSalle St.
San Francisco 4 — 420 Chancery Bldg.

6999

DRY MATERIAL CONVEYING SYSTEMS AND COOLERS
COMPRESSORS AND VACUUM PUMPS
FEEDERS AND ASSOCIATED EQUIPMENT

fuller

A-FH-3

One of a series *of messages to help you increase your understanding of business paper advertising, and its effect on your job.*

How much would NO advertising cost your company ?

SOME COMPANIES look upon advertising as an expense. When expenses have to be cut, the advertising budget looks like a good place to begin.

The only trouble with that theory is — it won't work.

Advertising can become expensive when you don't use *enough* of it. And "NO advertising" can cost far more than the "saving" it appears to create.

It's like failing to lubricate a piece of valuable machinery. You save the cost of the lubricant — but eventually there's a big repair bill to pay, not to mention your production losses while the machine is idle.

Advertising works something like a machine. It is the application of assembly-line methods to the five basic steps in the manufacture of a sale —

1. Seeking out prospects
2. Arousing their interest
3. Creating a preference for your product
4. Making a specific proposal
5. Closing the order

Can advertising perform all five of these steps? No, it usually takes a good salesman to handle the last two. But advertising *can* save much of his valuable time.

By mechanizing the *missionary job*, advertising becomes the most efficient method of manufacturing sales at a profit. Especially when it appears in the business press, where it is concentrated among your company's best prospects — *and no one else!*

THE ASSOCIATED BUSINESS PAPERS
205 East 42nd Street, New York 17, N. Y.

Changes in Food Supplies

Storage

FROZEN FISH AND SHELLFISH held in storage on Nov. 1, totaled 166,439,873 lb., compared with 156,077,303 lb. held on the same 1949 date.

PUBLIC COOLER occupancy increased 9 points during October, ending the month at 72 percent. This compares with an average of 71 percent and marks the first time since Jan. 31, 1948, that the occupancy level has been greater than its respective average for any period.

PUBLIC FREEZER space was only 1 point below average on October 31, rising 4 points during the month to stand at 78 percent. This was 8 points above the same date the year before.

Stocks

Canned Fruits and Vegetables in canners' hands November 1 compared with same date a year ago, were reported by the National Canners Association as follows:

	(000 omitted) Actual Cases	
	1949	1950
Peas	15,757	18,768
Sweet Corn	29,030	18,843
Red pitted cherries	1,296	1,889
Sweet cherries	860	540
Peaches	13,731	7,831
Apricots	1,978	1,687
	(dozens)	
Baby food	49,516	63,124

Production

CORN canned in 1950 came to 18,241,000 cases computed on a 24/2's basis, which compares with 29,795,000 cases, on the same basis, packed in 1949.

PEACHES canned in 1950 totaled 16,616,538 cases on a 24/2½'s basis. Year earlier the pack came to 19,133,748 cases.

FROZEN CUT CORN packed in 1950 reached 33,949,311 lb., about 9 percent smaller than 1949, according to the estimates of the National Assn. of Frozen Food Packers. It was the largest, however, for any other year except 1946.

BUTTER produced in October, according to the American Butter Institute, reached 92,100,000 lb., about 9 percent under the previous October. This was the first time in 1950 that monthly production fell below the 1945-49 average of 95,300,000 lb.

MARGARINE production in October totaled 73,943,000 lb., slightly under the previous year's October output of 75,975,000 lb., in the estimates of the National Assn. of Margarine Manufacturers. Estimates of total production for the first 10 months of 1950 come to 754,000,000 lb., compared to 712,000,000 lb. in the same 1949 period.

ICE CREAM production in October is estimated at 41,720,000 gal. This was 7 percent larger than October, 1949, but 6 percent smaller than the 1944-48 average for the month. September-October decline was only 11 percent, compared with 17 percent in 1949, and a 5-year average drop of 20 percent.

NONFAT DRY MILK SOLIDS production in October dropped to 35,800,000 lb., down 35 percent from the previous October, but up 8 percent from the 5-year average for the month. Output for the first ten 1950 months was running 6 percent under the previous year.

DRY WHOLE MILK production reached 11,300,000 lb., in October, up 9 percent from September, and up 37 percent from October, 1949. It was down 8 percent, however, from the 5-year average for the month. For the first ten months, production about equaled the same period a year ago.

LIQUID EGG production during October totaled 9,910,000 lb., compared with 6,909,000 lb., in October, 1949, and the 5-year average of 20,947,000 lb.

DRIED EGG production in October came to 1,984,000 lb., as against 937,000 lb. in October, 1949 and the 5-year average of 6,000,000 lb.

FROZEN EGG production reached 4,535,000 lb., in October, compared with 3,657,000 lb. during October, 1949, and a 5-year average for the month of 4,616,000 lb.

Indexes

Business Week's index of business activity advanced to 226.5 for the week ending Dec. 9, up about 8 points from the previous week's 218.0. A month before it had been 219.1, and a year before, 186.8.

THE COMMODITY INDEX on foods, compiled by the *New York Journal of Commerce*, stood at 192.3 for the week ending Dec. 15, compared with 195.3 for the previous week. Average for November was 182.5, and for December 1949, it was 170.9.

Low Cost Fortifiers Help Meet Tougher Competition!

ONE added low cost nutritional fortifier can spark advertising and sales . . . provide fresh appeals to consumers . . . put you far ahead of your competitors!

One of our technical men will be pleased to consult with you. No obligation! Special Products Division, STANDARD BRANDS INCORPORATED, New York 22, N. Y.

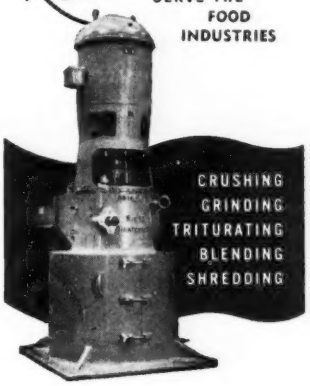
VITAMIN D PRODUCTS: Hy-Dee Irradiated Dry Yeast, Irradiated Dry Yeast Type 700-H, Viosterol (Irradiated Ergosterol).

NATURAL B-COMPLEX PRODUCTS: Pure Primary Dry Yeast (brewers' type), Bee-Flex Products, Yeast Extracts, Yeast Extract and Liver, Fortified Yeast with Iron.

Fleischmann's

"First For Food Fortification"

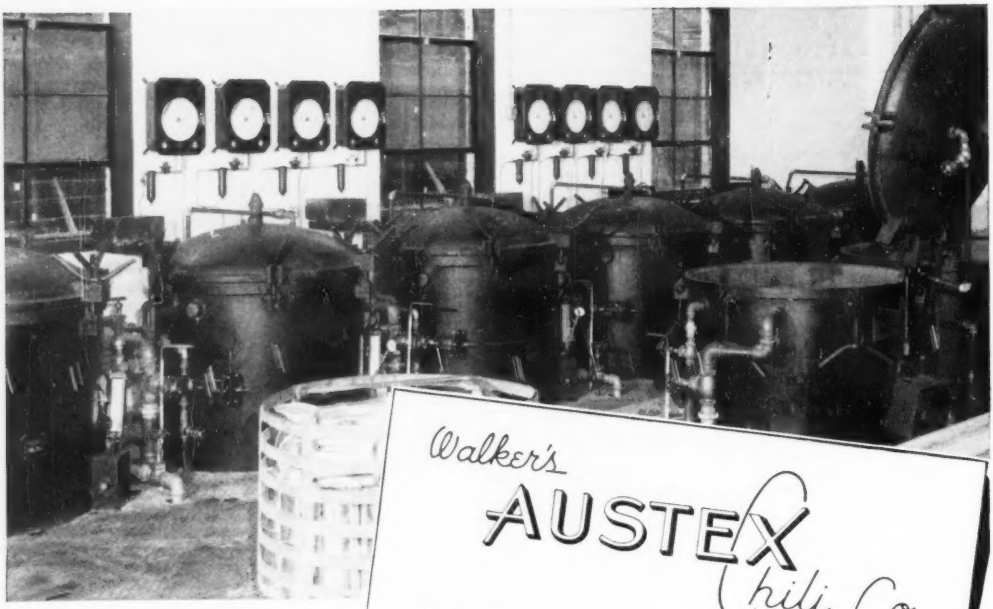
Rietz DISINTEGRATORS SERVE THE FOOD INDUSTRIES



- *34 Standard Models*
- *Two Speeds*
- *1800 & 3600 RPM*

WRITE FOR ILLUSTRATED BULLETIN 501

Rietz MANUFACTURING CO.
441 Folsom Street
San Francisco 5 • California



New, Taylor-controlled retort line at Walker's Austex Chili Co., Austin, Texas.

Walker's
AUSTEX Chili Co.

Austin, Texas

Gordon E. Mills
VICE-PRES. & PROD. MGR.

November 3, 1950

Taylor Instrument Companies
7041 Harrisburg Boulevard
Houston, Texas

Attention: Mr. Joseph C. Laley

Dear Mr. Laley:

Feel sure that you will be glad to learn that we are quite pleased with the operation of our latest Taylor instrumentation on our new Retort Line.

We are impressed with the simplicity of operation and precise control of temperature, which is so necessary for maintaining consistent quality control.

Sincerely yours,

WALKER'S AUSTEX CHILI COMPANY

Gordon E. Mills

Gordon E. Mills
Vice-Pres. & Prod. Mgr.

GEM/inr

Instruments for indicating, recording and controlling temperature, pressure, humidity, flow and liquid level.

Taylor Instrumentation means: (**1**) Precision instruments. (**2**) Many years of processing know-how. (**3**) Quick, effective service from Taylor Field Engineers whenever it's needed. Whatever your process specify "Taylor-Equipped, As Usual!" WRITE FOR CATALOG 500! Ask your Taylor Field Engineer for complete details on controls for Retorts, Blanchers, Juice Heaters, Lye Peelers, Exhausters, Continuous Cookers, Cooling Canals, Deaerators, Jam and Jelly Kettles, etc. Taylor Instrument Companies, Rochester, N. Y., and Toronto, Canada.

Taylor's Centennial

TAYLOR INSTRUMENTS MEAN ACCURACY FIRST

Men, Jobs, Companies

ROBERT A. NANZ recently joined the research laboratories of Florida Citrus Canners Cooperatives, Lake Wales. He was formerly director of Food Technology section, Foster D. Snell, Inc., New York City.

H. FREDERICK WILLKIE has been elected president of Kingan & Co., meat packing firm. A brother of late Wendell Willkie, he was formerly vice-president of Distillers Corp. Seagrams, Ltd.

LOUIS A. PELTON, formerly vice-president of Pompeian Olive Oil Corp., Baltimore, has been named assistant to president of Hart's Fruit Products Co., Brea, Calif. He will supervise sales activities.

BERNARD E. PROCTOR, professor of food technology at MIT, has been elected chairman of the American Chemical Society's division of Agricultural & Food Chemistry, succeeding L. E. Clifcorn, Continental Can Co.

Industry

American Bakeries Co., Atlanta, Ga., is building a $1,000,000 plant at Rocky Mount, N. C. Daily capacity will be 120,000 lb. of baked goods.

Burry Biscuit Corp., Elizabeth, N. J., has purchased the capital stock of Independent Biscuits, Inc., Davenport, Iowa. The transaction was said to have been closed for $1,250,000.

Canners Cooperative Steam Co. is building a $1,000,000 central steam plant at Terminal Island, Calif. The following companies are financing the project: California Marine Curing & Packing Co., South Coast Fisheries, Inc., French Sardine Co., Van Camp Sea Food Co., Inc., and Terminal Island Sea Foods, Ltd.

Certified Grocers of California, Ltd., has a $350,000 expansion program underway at its Los Angeles plant. Plans call for a two-roaster coffee plant that will have a daily capacity of 10,000 lb.

Consolidated Grocers Corp. has acquired the food division of the H. D. Lee Co., Inc., Kansas City, Mo. Latter serves more than 600 individually owned retail food stores in the midwest and southwest.

Continental Baking Co. plans a $1,600,000 plant in Sacramento, Calif. Half of that will be for the building, other half for equipment.

Kraft Foods Co.'s manufacturing plant at Olive Branch, Tenn., was permanently closed on Nov. 25. Reason given was that dairying in the area had not gone forward at the pace company had anticipated. Construction of Atlanta, Ga., plant has begun.

W. K. Kellogg Co., Battle Creek, Mich., has purchased the Northern Illinois Cereal Co., Lockport, Ill., manufacturer of rolled oats and macaroni.

Mayonnaise & Salad Dressing Manufacturers Assn. has elected following officers for 1951: Samuel G. Domash, Conway Import Co., President; Olen C. Turner, Morton Foods, First Vice-President; Wendell W. Bishop, Mrs. Clark's Foods, Second Vice-President; Theodore Marks, Recipe Foods, Secretary; and Harry A. Tuttle, M. A. Gedney Co., Treasurer.

National Assn. of Popcorn Manufacturers has elected following officers for 1951: Leonard M. Japp, Special Foods Co., President; Ruby C. Adams, Adams Popcorn & Nut Supply Co., Vice-President; Harry T. McNamara, Blue Star Foods, Inc., Treasurer; and Thomas J. Sullivan, Executive Vice-President.

Old Dominion Packing Corp., Richmond, Va., plans an expansion program that will approximately double the floor space and working area of its present plant.

Palm Beach Pineapple Co., West Palm Beach, Fla., is now packing fruits imported from Cuba. Reason is that continuing labor troubles in Cuba have made it more advantageous to can Cuban products in Florida than to obtain them canned from Cuba.

PictSweet Foods, Inc., has announced it will expand corn packs in 1951 at its Mount Vernon, Wash., and Albany, Ore., plants. This will permit canning of 500,000 cases of peas and corn at the former and freezing of 150,000 cases of corn at the latter.

Wilson & Co., Chicago meat packer, may move an oleomargarine department from Kansas City, Kan., to Oklahoma City.

Personnel

John S. Allen, formerly sales and advertising manager of the Jell-O Div. of General Foods, has been appointed special assistant to G. O. Bailey, general manager of the Bird's Eye-Snider Div.

A. L. Croce has been elected secretary of California Packing Corp. to fill the vacancy caused by the death of Norman A. Hollister.

Alec Dale, formerly head of butter department, Wilson & Co., Chicago, succeeds E. J. Davidson, retired, as manager of the dairy and poultry division.

NOW-a truly
STAINLESS STEEL

SANITARY

FILTER PRESS

PLATE AND FRAME TYPE

1—Simple to clean—easy to maintain.

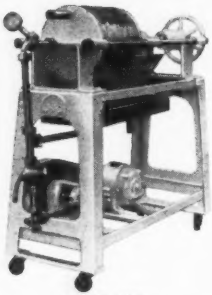
2—A truly Sanitary Filter Press—all surfaces polished, no crevices where bacteria may collect.

3—"Snap-Lock" perforated screens — no screws to hold screens in place, no soldered elements.

4—No gaskets—no contamination, minimum leakage.

5—Any thickness sludge and cake frames.

6—Type #302-#304—or #316 Stainless Steel.



MODEL 10SS
OPEN—READY TO CLEAN

Proven by use in filtering—hot frying oils, citrus juices, milk and milk products, extracts, vinegar cider, syrups, alcoholic and non-alcoholic beverages.

Star EST. 1904

LIQUID MACHINERY CORP.
871 Edgewater Rd., Hunts Point, Bronx 59, N. Y.

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Guardians OF THE NATION'S FOODS

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2055 West Pershing Road (Zone 9)

DALLAS
1114 Wood Street (Zone 2)

DETROIT
(United States Warehouse Co.)
1448 Wabash Avenue (Zone 16)

KANSAS CITY
500 East Third Street (Zone 6)

PORT LAVACA
TEXAS. P. O. Box 176

UNITED STATES COLD STORAGE CORP.

5 MODERN FORTRESSES FOR GUARDING THE NATION'S FOODS

O. E. DROEGE, head of Swift & Co.'s dairy and poultry department, has been elected president of the American Butter Institute for 1951. New vice-president is A. E. McGrath, Sugar Creamery Co., Danville, Ill. Just-elected directors are W. P. Ayers, Charles de Golier, Sol Eisenstein, Nick Fennema, L. P. McCoun, Vern Moore, D. A. Nickerson, Roy Robichaux, and Clarence Steck.

Fred M. Drew, formerly president of the Drew Canning Co., Campbell, Calif., and in 1945 president of the Canners League of California, has been elected president of the United States Products Corp., succeeding the late Carl N. Lovegren.

W. S. Holliman has been named manager of the Ouachita Valley Dairy Ass'n.'s milk plant at Camden, Ark.

Charles E. Kennedy has been elected president of the Union Biscuit Co., Kirkwood, Mo.

A. J. Lenz has been made superintendent of the Chicago plant of Wilson & Co., replacing Charles Cameron, retired. M. R. Swanson will assist him.

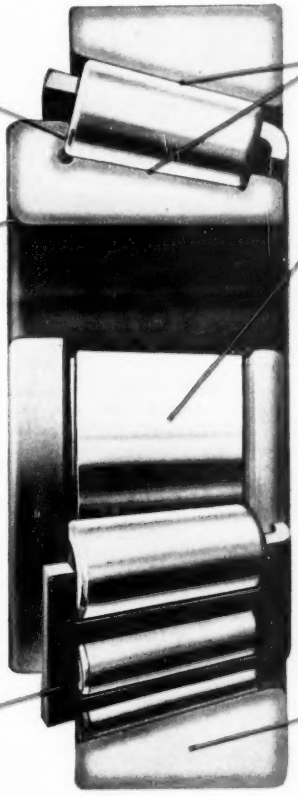
Frank Materson has been appointed general manager of the Pompeian Olive Oil Co., Baltimore, Md.

John L. Parry has been made sales manager of the bulk edible department of Lever Bros. Co., New York.

Charles B. Read has been named general manager of the Shredded Wheat Bakeries of National Biscuit Co. in Niagara Falls, Ont.

Thomas R. Reid, formerly director of human relations at McCormick & Co., has resigned to accept a position with the Ford Motor Co. He has been succeeded by Rear Adm. Frederick J. Bell.

10 reasons why your best bet in bearings is TIMKEN®



1 *Rib of cone maintains roller alignment, prevents skewing, assures maximum bearing capacity.*

2 *Generous radius permits greater shaft strength.*

3 *Available in 26 different types.*

4 *Precision manufactured. Available with runout tolerance of only seventy-five millionths of an inch (.000075").*

5 *Soft steel cage separates rollers, prevents scuffing.*

6 *Case-hardened surfaces resist wear.*

7 *Micro-inch surface finish makes friction negligible.*

8 *Available in 5850 sizes.*

9 *Made from Timken fine alloy steel for long bearing life.*

10 *Tough inner core resists shock.*

OTHER tapered roller bearings may *look* like Timken® bearings. But there is no other tapered roller bearing which gives you as many important advantages as you get with Timken.

Ten of these advantages are listed above. They all stem from the fact that the Timken Company is the foremost producer of tapered roller bearings and leads in (1) advanced design, (2) precision manufacture, (3) rigid quality control, (4) special analysis steels.

Be sure that every tapered roller bearing *you* use carries the name "Timken", the trade-mark of The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS

NOT JUST A BALL ○ NOT JUST A ROLLER ▭ THE TIMKEN TAPERED ROLLER ▱ BEARING TAKES RADIAL ◫ AND THRUST ⟷ LOADS OR ANY COMBINATION ⊹

Safeguarding
BEVERAGE QUALITY
cleaning in the food industry
OAKITE
Protecting Bakery Product Quality with Modern Oakite Sanitation Methods
How to cut sanitation costs in meat packing plants
with OAKITE

4 fact-filled guides to low-cost, plant-wide sanitation—FREE

Now—whether you process meat, food, soft drinks, or baked goods—you can get practical answers to your cleaning problems in these Oakite guides to sanitation. Packed with photographs, diagrams, step-by-step details, they tell

1 **Bottlers** how to get film-free bottle washing, trouble-free machine operation. Sanitary conveyor chain lubrication. Faster, more thorough bacteria and mold control. Quick removal of scale from water-circulating equipment.

2 **Food Processors** how to steam-clean packaging machines, trimming tables, tubs, vats, tanks, conveyors, elevators. Remove grease, stains, tarnish from metal equipment. Chemically sterilize. Remove rust and scale from heat-exchangers.

3 **Bakers** how to clean bread pans, cake and pie tins without spangling or discoloration. Clean aluminum angel food pans without damage. Steam-clean bread and cake racks in half the time. Control mold growth. Remove rust, scale, slime, algae from humidifying equipment.

4 **Meat Packers** how to clean beef kill floors, wooden curing vats, beef chilling vats, cooking kettles. Clean smoke house walls and ducts in half the time, without scraping. Scald hogs without damage to hides, without fouling tanks. Remove scale from water circulating units. Batch-clean 500 trolleys in 1 hour.

FREE booklets tell *all* about floor cleaning, deodorizing, paint stripping, fleet maintenance—other Oakite short-cuts to low-cost, plant-wide sanitation. Write Oakite Products, Inc., 14C Thames St., New York 6, N.Y.

SPECIALIZED INDUSTRIAL CLEANING
OAKITE
MATERIALS • METHODS • SERVICE

CLARENCE ELDRIDGE, formerly general manager of Post Cereals Div., General Foods Corp., has been promoted to manager of operations, with responsibilities for five divisions.

Henry L. Woods has been appointed manager of Armour and Company's Northfork, W. Va., plant.

Leonard A. Zerull, formerly superintendent of General Mills' Purity Oats plant at Keokuk, Iowa, has been made superintendent of the company's wheat flour mill in Louisville.

Associated Industry

Allis-Chalmers Mfg. Co., Milwaukee, has appointed Kenneth R. Geist as director of purchases.

Dutchess Bread & Roll Machinery Co. has appointed Oliver W. Meyer exclusive factory representative for part of the southern area.

The Goodyear Tire & Rubber Co., Akron, has appointed J. D. Stimpson as a Pliofilm packaging specialist for self-service meats.

Industrial Filter & Pump Mfg. Co. has appointed A. Tonkonogy as its metropolitan New York district sales representative.

Sefton Fibre Can Co., St. Louis, subsidiary of Container Corp. of America, is constructing a new plant in Ohio.

Wm. J. Stange Co., Chicago, has appointed C. A. Wood, general sales manager. He succeeds Edward J. Marum, deceased.

Deaths

James I. Beals, Jr., 55, president of the Franklin Peanut Co., Franklin, W. Va.—Nov. 7.

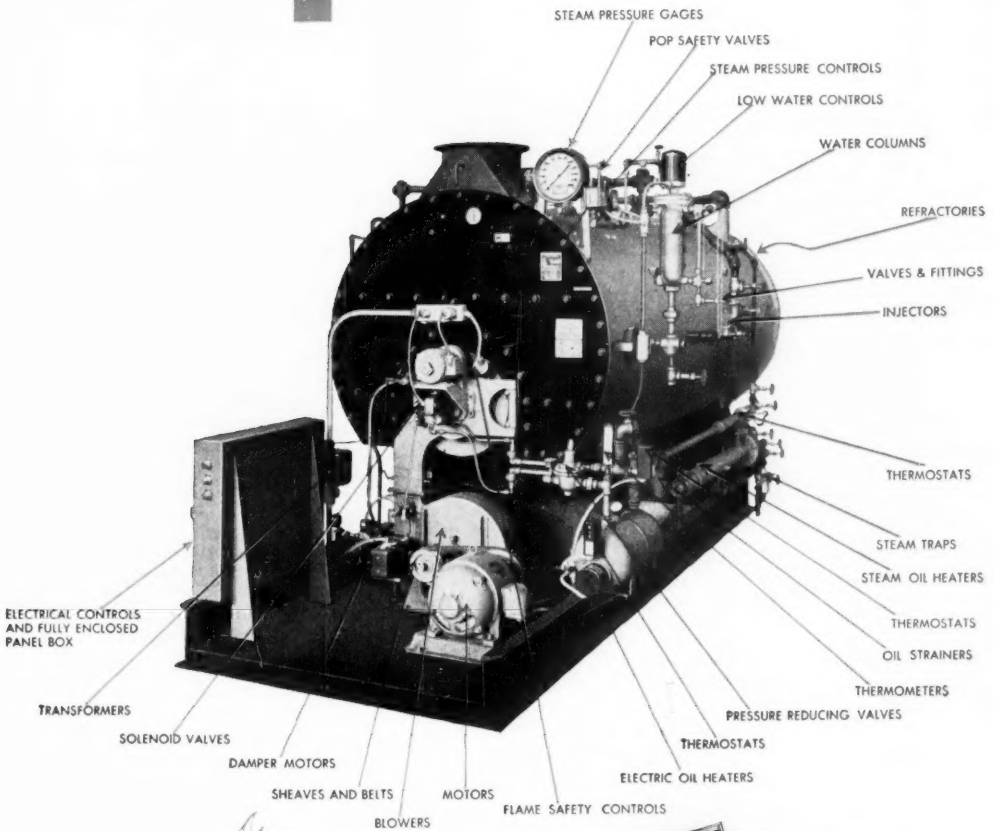
Matched quality components

another reason why you get a greater return from your investment in a Cleaver-Brooks Steam Boiler

Cleaver-Brooks steam boiler quality is the sum of many qualities. From the rolling-in of the first tube and through every step to completion, the highest standard of engineering, material and workmanship prevail. Every component is the tested product of a manufacturer of known standing — carefully selected by Cleaver-Brooks engineers through test and research.

Your Cleaver-Brooks boiler is the end-product of many specialized engineering talents and manufacturing skills. When you install Cleaver-Brooks you have a steam boiler of foremost quality — with immediate and long-range cost-saving advantages. Cleaver-Brooks self-contained Boilers — 15 to 500 HP 15 to 250 lb. p.s.i.— for oil, gas, combination oil and gas firing.

CLEAVER-BROOKS CO., 327 E. Keefe Ave., Milwaukee 12, Wis.



Cleaver-Brooks
STEAM BOILERS

NEW — The Cleaver-Brooks Steam Boiler Catalog — interesting — informative — beautifully illustrated. Write — on your business letterhead for your copy — no obligation.

Packer speeds processing of sliced apples

● Prepared pie apples must be chemically treated to retain that "just sliced whiteness" when they reach the baker. This processor finds that a Cyclone Stainless Steel Flat Wire Conveyor Belt is a very economical way to carry apples from the slicing machines through the chemical bath and to the packing tables. Steady flow of slices to containers is established.

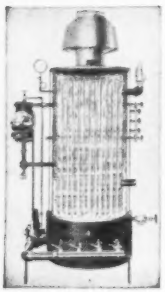
There are "bottlenecks" in many food plants that can be eliminated with the installation of the "right" Cyclone Conveyor Belt. Our experienced engineers will be glad to advise you which of our 3 types—Flat Wire, Flex-Grid or Chain Link—will best serve you. And write for our free catalog #4.

CYCLONE FENCE DIVISION
(American Steel & Wire Company)
DEPT. H-11, WAUKEGAN, ILLINOIS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS **CYCLONE**
METAL CONVEYOR BELTS
UNITED STATES STEEL

WE BELIEVE WE CAN TURN YOUR STEAM PROBLEM into NO PROBLEM AT ALL!

our solution . . .



The KANE Boiler, built to A.S.M.E. specifications. In sizes to 30 H.P.

the KANE BOILER PACKAGE

Each KANE BOILER PACKAGE is carefully considered by us as an "individual" job,—from the customer's requirements to the finished unit. And each BOILER PACKAGE is a compact, self-contained steam source that includes: the correctly sized KANE Automatic Gas-Fired Boiler complete with gas burner and controls to maintain required steam pressure; and an M-K-O Automatic Boiler Feed system designed to return condensate and supply make-up water as required for highest operating efficiency.

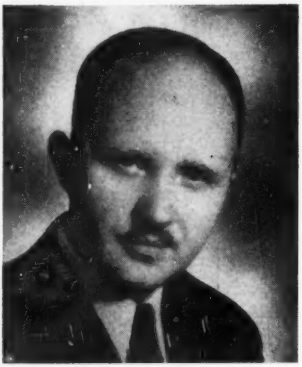
Engineered Steam at its best, with four decades of experience at your disposal—so, send your steam problem to us for study and recommendation.

WE'VE RECENTLY MOVED . . . and will now serve you from our modern newly completed Factory and Office Building. Our new mailing address is as given below.

MEARS-KANE-OFELDT INC.

P.O. BOX 223 -:- BRIDGEPORT, PA.

FOUR DECADES OF AUTOMATIC GAS-FIRED BOILER MANUFACTURING EXPERIENCE



HAROLD W. McGHEE has joined Hanscom Baking Corp., Long Island City, N. Y., as chief of bakery operations. He formerly held a similar position with Panaficadora Vilamizar, Caracas, Venezuela.

Thomas R. Clouston, 50, general manager and vice-president of General Seafoods, Ltd., subsidiary of General Foods Corp.—Nov. 1.

Ernest E. Deibel, 79, president and general manager of the George J. Renner Brewing Co.—Nov. 19.

Samuel C. Dobbs, 81, former president of the Coca Cola Co.—Oct. 31.

Henry F. Eggert, 84, former president, Original Allegretti, Inc., Chicago, candy manufacturer—Nov. 19.

J. W. Greer, 73, founder of the J. W. Greer Co., manufacturers of production machinery for the confectionery, baking and other food industries—Nov. 1.

Carl N. Lovegren, 56, president of U. S. Products Corp., Ltd., San Jose, Calif., and past president of the Canners League of California—Nov. 1.

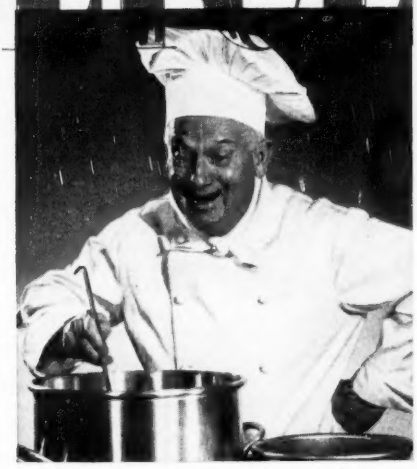
Charles O'Hara, 76, vice-president of Cudahy Bros. Co., Cudahy, Wis.—Nov. 4.

Victor Reynolds, 52, general superintendent, J. D. Roszell Co., Peoria, Ill., ice cream manufacturer—Nov. 19.

James Rockwell, 51, production manager, Hunding Dairy Co., Chicago, and past president of the Chicago Dairy Technology Society—Oct. 29.

Frederick E. Stillman, 71, executive vice-president of James H. Forbes Tea & Coffee Co.—during November.

GLYCERINE



IMPORTANT FOR FOODS...

...IMPERATIVE FOR NATIONAL DEFENSE!

Important? "Indispensable" is a better word for U.S.P. Glycerine! Nutritious and easily digested, it serves equally well as solvent...sweetener...humectant...softener...and preservative in hundreds of food products!

That's part of the reason why Glycerine is now one of the first 6 chemicals under inventory control*... So if you find it a "hard-to-get" item these days—remember, Glycerine is doing double duty on our own dining tables and in energy-producing combat rations, as well as a host of other military applications!

*By Government authorities responsible for inventory control under the National Defense Act.

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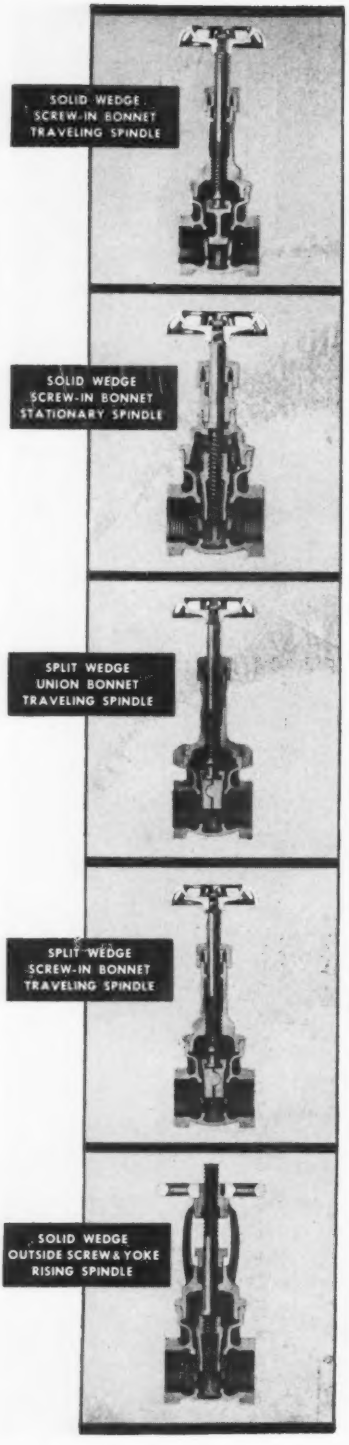
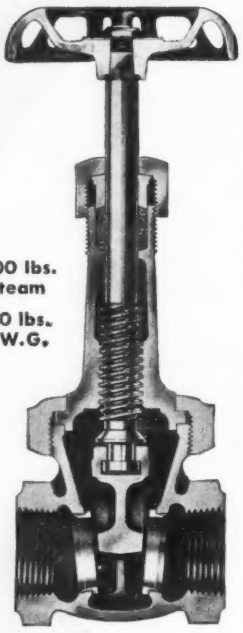


Specify JENKINS for your Best Buy in Bronze Gates



200 lbs. Steam

400 lbs. O.W.G.

JENKINS FIG. 270-U

Solid Bronze Wedge

and FIG. 270-UN

Nickel Alloy Wedge

Traveling Spindle — Union Bonnet

BRONZE GATES

Monel and Bronze Seating Combination Adds Years of Extra Service Life

In Fig. 270-U, a high quality bronze wedge seats against MONEL rings expanded in the body. With this sensible design, the wear affects only the most accessible part—the bronze wedge—which can be easily replaced by slipping a new one on the stem when necessary. Records in every type of service prove it an excellent combination for lasting economy.

Fig. 270-UN, with a nickel alloy wedge, is recommended for exceptionally severe conditions of rapid wear and corrosion.

The Gates For Your Toughest Services

Made in sizes from ¼" to 2", Fig. 270-U or Fig. 270-UN will provide unequalled economy in any 200 lb. steam, 400 lb. O.W.G. service. Compare performance, especially where conditions are most destructive to valves, as in oil refineries, dye houses, chemical, rubber, and food plants. You'll find there are no other valves like them.

Whatever your need in Bronze Gates, you'll find the right valve for the service in Jenkins complete line. Thirty-five different patterns are available for steam pressures up to 300 lbs., O.W.G. pressures up to 600 lbs. All are built to Jenkins unvarying high standard which makes them the longest-lasting, lowest-upkeep valves that money can buy. Jenkins Bros., 100 Park Ave., New York 17. Jenkins Bros., Ltd., Montreal. Sold through leading Industrial Distributors.

WRITE FOR THIS FOLDER Form 181-B It describes the Fig. 270-U and other popular Jenkins Bronze Gates or, ask your Jenkins Distributor.

JENKINS VALVES

LOOK FOR THE DIAMOND MARK

SINCE 1864 TRADE JENKINS MARK

Jenkins Bros

Books

Fruit and Vegetable Analysis Methods Outlined and Explained by Joslyn

METHODS IN FOOD ANALYSIS APPLIED TO PLANT PRODUCTS. *By Maynard A. Joslyn. Published by Academic Press, 125 E. 23rd St., New York, N. Y., 1950. 525 pages; 6¼x9¼ in.; cloth. Price, $8.50.*

This book is intended as a reference and text on the physical and chemical methods used in laboratory examinations and evaluations of commercial fruit and vegetable products.

According to the author, the book is an attempt to explain "certain of the more important methods of food analysis, stressing in particular the principles involved." While the methods are, in general, those in common use for analyzing fruit and vegetable products, the principles may also be applied to other products. Previous training in qualitative and quantitative analysis and in organic and inorganic chemistry is assumed.

The book grew out of a set of lecture notes and laboratory directions compiled over a period of more than 20 years, during which the author was conducting courses on the laboratory examinations of these products.

Dr. Joslyn is well known among food technologists for his research on fruits and vegetables. He is professor of food technology at the University of California and biochemist in the California Experiment Station.

Antibiotic Abstract

HANDBOOK OF ANTIBIOTICS. *By A. L. Baron. Published by Reinhold Publishing Co., 330 W. 42nd St., New York 18, N. Y., 1950. 6¼x9¼ in.; 303 pages; cloth. Price, $6.50.*

Interest in antibiotics has been mounting in the food field during the past year or two. Thus, appearance of this treatise is timely for food chemists. In a most compact form, the book gives the methods of production, chemistry, toxicology, bacteriology, pharmacology, and related information, on as complete a list of antibiotics as is apt to be found anywhere.

This information is limited to factual data, presented for the most part in outline form. The data is supplemented by tables and statistical summaries. Individual antibiotics are treated alphabetically, which greatly enhances the book's reference value.

Soybean Assemblage

SOYBEANS AND SOYBEAN PRODUCTS. *Vol. I. Edited by Klare S. Markley. Published by Interscience Publishers, Inc., 250 Fifth Ave., New York 1, N. Y., 1950. 540 pages; 6¼x9¼ in.; cloth. Price, $11.*

During the past quarter century the soybean has developed from relative insignificance to first place among the oilseed crops in the Western Hemisphere. Naturally, books have appeared from time to time on various aspects of the subject. But with such rapid expansion none could be expected to encompass all the detailed information developed in every field in which the soybean has become involved.

This volume—along with a companion volume to be published early in 1951—does attempt to collect all that is known about the soybean. Experts have contributed individual chapters in their specialized fields, while technological processes are presented primarily from the viewpoint of present industrial practice in this country.

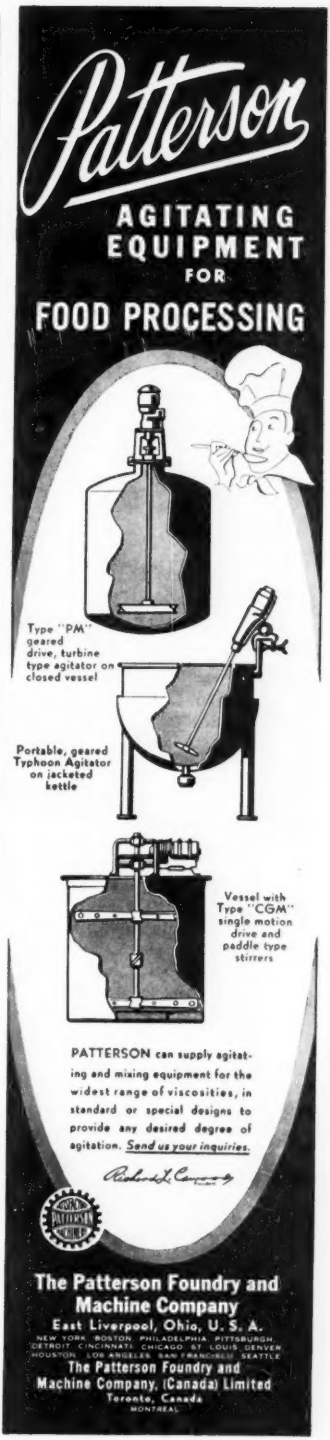
This first volume considers production, structure and composition, and processing. Volume II will be devoted to utilization of soybean products, except for one chapter on solvent-extraction processes.

Canned Nutrition

CANNED FOODS IN HUMAN NUTRITION. *Edited by E. J. Cameron and J. Russell Esty. Published by National Canners Assn., 1133 Twentieth St., N. W., Washington 6, D. C., 1950. 264 pages; 5½x8 in.; cloth. Available free to qualified applicants.*

This is a special report on the investigation into the nutritive value of canned foods inaugurated in 1941 by the Can Manufacturers Institute and the National Canners Assn. It also condenses the general history of nutritional knowledge, giving to most readers a clearer understanding of that science.

The book includes tables on the protein, carbohydrate, fat, amino acid,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AGITATING EQUIPMENT FOR FOOD PROCESSING
Type "PM" geared drive, turbine type agitator on closed vessel
Portable, geared Typhoon Agitator on jacketed kettle
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PATTERSON can supply agitating and mixing equipment for the widest range of viscosities, in standard or special designs to provide any desired degree of agitation. Send us your inquiries.
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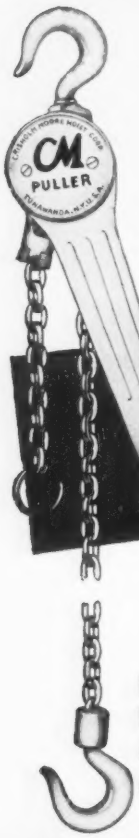
CM CYCLONE

LIGHT WEIGHT — HEAVY DUTY

High Speed CHAIN HOIST

There's nothing to compare with it! ***63% Less Weight:*** Of Alcoa Aluminum Alloy, the 1 ton capacity weighs only 35 lbs. Carry it anywhere with ease. Designed to stand the "gaff" of maintenance work. ***42% Fewer Parts:*** Long service life. ***96% Efficient:*** Lifts loads rapidly with easier pull on the chain. ***Herc-Alloy Flexible Load Chain:*** America's first welded alloy steel chain. ***Sealed-in Lifetime Lubrication:*** No attention required. ***Low Cost:*** No more than heavy old style chain hoists. Capacities: ¼ to 10 tons.



CM PULLER

The tool of a thousand uses for lifting, pulling, skidding, stretching, straightening. Use it vertically, horizontally, diagonally... any angle. Eliminates the dangers of makeshift methods. Holds the load where you leave it. Compact, light weight... the ¾ ton capacity model weighs only 13 pounds. Herc-Alloy flexible load chain. Labor saved more than repays initial low cost. Capacities: ¾, 1½, 3 and 6 tons.

LIFTS OR PULLS AT ANY ANGLE

YOUR LOCAL CM DISTRIBUTOR carries the CM Cyclone and the CM Puller in stock. Phone him for a demonstration in your plant.

CHISHOLM-MOORE

HOIST CORPORATION

(Affiliated with Columbus McKinnon Chain Corporation)

GENERAL OFFICES AND FACTORIES: TONAWANDA, N. Y.

SALES OFFICES: New York, Chicago and Cleveland • Distributors Everywhere

and vitamin content of a long list of canned food products. In all, there are 21 charts and maps, 30 tables, and 31 illustrations.

Food Literature

INDEX TO THE LITERATURE OF FOOD INVESTIGATION. *Published by His Majesty's Stationery Office, York House, Kingsway, W. C. 2, London, England,* 1950. *90 pages;* 6x9½ *in.; Price,* 6*s.*

Here is the latest issue of this important index to reach our shores. It brings the compilation of the English speaking world's food literature up to June, 1948.

Government Publications

MARKETING STUDY OF THE OIL CONTENT OF SOYBEANS AS RELATED TO PRODUCTION AREAS AND CLIMATE. *By Noriar Pahigian. Production & Marketing Administration. Unnumbered mimeograph.* A preliminary report on the first phase of an oilseed marketing research project, giving an analysis of the available data regarding the oil content of soybeans in various areas.

These recently issued documents are available, at the prices indicated, from the Superintendent of Documents, Government Printing Office, Washington 25, D. C. When no price is indicated, the pamphlet is free and should be ordered from the bureau responsible for its issue.

TECHNIQUES OF PREPARING MAJOR BLS STATISTICAL SERIES. *Bureau of Labor Statistics. Bulletin No.* 993. *Price* 40*c.* A compact presentation of the methods by which Bureau of Labor Statistics compiles its continuing series of figures dealing with industrial employment, labor turnover, wages, industrial safety, and other subjects.

FLAVOR, TEXTURE, COLOR, AND ASCORBIC ACID CONTENT OF HOME-DEHYDRATED VEGETABLES AND FRUITS. *By Elsie H. Dawson et al. U. S. Department of Agriculture. Technical Bulletin No.* 997. *Price* 20*c.*

RICE PREFERENCES AMONG HOUSEHOLD CONSUMERS. *U. S. Department of Agriculture. Agriculture Information Bulletin No.* 15.

COLLECTIVE BARGAINING PROVISIONS—HOURS OF WORK, OVERTIME PAY, SHIFT OPERATIONS. *Bureau of Labor Statistics. Bulletin* 908-18. *Price* 30*c.* One of the series presenting typical collective bargaining agreements.—*End.*

"MACK DIESELS cut our mile-per-gallon cost over 53%"

—*Stanley L. Wasie, Pres., Merchants Motor Freight, Inc.*

"Our 50 Mack diesels are one gilt-edged investment that pays big dividends," says Stanley L. Wasie, President of Merchants Motor Freight, Inc., of St. Paul, Minnesota.

"Before we took on Mack diesels we were averaging 4.5 miles per gallon from comparable gasoline-powered units. Mack diesels stepped that figure up to 6.9" — *a saving of 53.33%!*

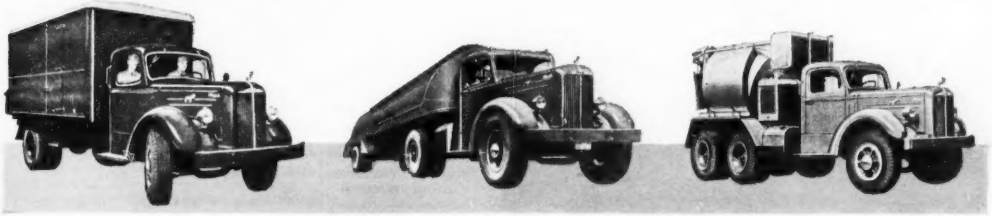
Other Mack diesel operators are getting the same brand of economy. Mack diesel-powered trucks and tractors not only give you the double saving of *more miles per gallon* at *less cost per gallon*, but also the savings that *"Built like a Mack"* brings to every Mack owner.

And they are: more time on the job, *less absenteeism*, longer life — savings that put thousands of extra dollars into the pockets of Mack owners. There's a complete Mack line to meet every operator's requirements — and your Mack branch or distributor can tell you a dollar-saving story that's worth hearing.

Mack TRUCKS

...outlast them all!

Mack Trucks, Inc., Empire State Building, New York, N.Y. Factories at Allentown, Pa.; Plainfield, N. J.; Long Island City, N.Y. Factory branches and distributors in all principal cities for service and parts. In Canada: Mack Trucks, Ltd.



This H & D corrugated display box makes barbeques extra fattening — for sales figures!

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Equipment Catalogs, Bulletins

Galaxy of Packers' Incidental Supplies

More than 2,000 tools and supplies that can be used in the processing and handling of meats are pictured and specified in 84-page Catalog 501. Included are knives, locker needs, trucks, clothing, scales, containers, rendering equipment, slaughtering machinery, tables, and grinders. Accompanying 66-page booklet contains up-to-date prices. Cross references simplify using both bulletins together. —*The Globe Tool & Supply Co., 4000 S. Princeton Ave., Chicago 9.*

Comprehensive Discussion of Spray Drying

A well-documented presentation of the operation of spray drying, its principles and advantages, is proferred in 16-page Bulletin D-105. Particularly informative are the diagrammatic sketches of spray drying installations for milk products, sulphite liquor, and soluble coffee extract. A laboratory set-up is also included. Accompanying pictures of spray dryers and their accessories in processing plants, round out the booklet.—*Swenson Evaporator Co. (division of Whiting Corp.), Harvey, Ill.*

Combination Motor, Speed Reducer Detailed

The Gearmotor, combining a squirrel cage induction motor and a gear unit in one housing, is fully delineated in a new 42-page cardboard-bound booklet. A cutaway drawing shows complete construction of the unit. In the rest of the publication there are application sheets and also 12 pages of dimensions for single, double and triple reduction gears on seven types of motors. The gear unit portion is manufactured by Foote Bros. Gear & Machine Corp., Chicago.—*The Louis Allis Co., Milwaukee 7.*

Complete Index on Packings

All material on Palmetto packings previously made available in separate sheets has been brought together in 20-page Catalog PC-101. Each individual packing is pictured and particularized according to applications, structure and performance. Sections are divided under the following headings: Self-lubricating, molded, and sheet packings. Included also are those types for liquid pistons and inside-packed piston pumps.—*Greene, Tweed & Co., North Wales, Pa.*

Food Plant Equipment

Blow-Off Valves

For high pressure boilers with working steam pressures from 400 to 2,500 psi., complete line of blow-off valves is specified and pictured in 24-page Bulletin B-433. Types shown are seatless, hard-seat, and unit-tandem. —*Yarnell-Waring Co., Chestnut Hill, Philadelphia 18.*

Automatic Weighing System

Operating sketches feature 8-page bulletin on new automatic weighing system, called Hy-Tra-Lec. Designed for filling packages, it works on the positive displacement principle, rather than employing conventional beam or spring scales.—*Wright Machinery Co., Durham, N. C.*

Condensing Units

Capacities, specifications and water consumption tables for both air- and water-cooled condensing units are tabulated in 4-page folder.—*Lehigh Mfg. Co., Lancaster, Pa.*

Packaged Water Heating

Five sizes of all-bronze steam mixer water heaters—flows ranging from 600 to 5,500 gph. —are rated and specified in 4-page Bulletin SM-41. They are packaged units that mix steam directly with water to provide instantaneous hot water.—*O'Brien Steam Specialty Co., Inc., Heffernan Bldg., Syracuse 2, N. Y.*

Synchronous Motor-Generator Sets

Construction features and installations of synchronous motor-generator sets from 30 to 8,000 kw. are covered in 8-page Bulletin GEA-5506. For d.c. power, motor ratings include 60, 50 and 25 cycles, while generators, both shunt and compound wound, are rated 125, 250 and 600v.—*General Electric Co., Schenectady 5, N. Y.*

New Magnetic Separator Models

Three new models of magnetic separators, each in a full range of sizes, are described in 2-page leaflet. Improvements give added strength, easier installation, better protection against shorting.—*Eriez Mfg. Co., 701 E. 12 St., Erie, Pa.*

Ammonia Compressors

Application of multicylinder high-speed Freon and ammonia compressors for high-stage or booster refrigeration service is detailed in 8-page Bulletin 017. A discussion is included to accent advantages of multi-stage compression for producing low temperatures.—*The Vilter Mfg. Co., Milwaukee 7.*

Steam Traps

Specifications, capacities and pressures of Super-Silvertop steam traps are described in 4-page Bulletin 550. Advantages claimed for inverted bucket-type traps are listed.—*V. D. Anderson Co., 1935 W. 96 St., Cleveland 2.*

Multi-Stage Centrifugal Pumps

New line of multi-stage centrifugal pumps for high-pressure applications to 1,200 psi. and 1,600 gpm. is illustrated in 16-page Bulletin 7233. Size 3-, 4-, 5- and 6-in. from 3 to 9 stages are available.—*Ingersoll-Rand Co., 11 Broadway, New York City 4.*

Right Angle Speed Reducer

All-steel right angle Motoreducer is classified, dimensioned and specified in 16-page Bulletin 3110. It is for either horizontal or vertical applications, with output shaft single or double ended. Input speeds can go up to 1,750 rpm., and ratio ranges are from 5:1 to 972:1.—*The Falk Corp., Milwaukee 8.*

Synchronous Motors, Generators

High speed synchronous motors and generators for speeds from 500 to 1,800 rpm. are detailed in 12-page Bulletin 505. Two models, one with direct connected exciter, the other with aloft mounted exciter, are diagrammed.—*The Ideal Electric & Mfg. Co., Mansfield, Ohio.*

Worm Gear Drives

Eighty-page Book 2324 gives complete data on three basic types of worm gear drives. Speed ratios vary from 4:1 to 8,000:1. Special section contains solutions to typical drive problems.—*Link-Belt Co., 307 N. Michigan Ave., Chicago 1.*

Steam and Air Traps

Capacity tables and sizing information for line of steam and air traps are included in 4-page Bulletin 101. Blast trap attachment and double valve mechanism are also shown.—*The C. F. Squires Co., 18502 Syracuse Ave., Cleveland 10.*

Automatic Sheaves

Instant speed control is reported obtained with the automatic Vari-pitch sheaves particularized in 12-page Bulletin 20B7223A. The motor is simply moved toward the sheave for higher speeds, away for lower. Variation in a 2-to-1 range is possible for 1½ to 40-hp. motors. —*Allis-Chalmers Mfg. Co., Milwaukee 1.*

Centrifugal Pumps

Designed to fit the idea of a service and exchange plan, new model centrifugal pump is reported in 8-page Bulletin 1001. All its parts, except the bare pump casing, are contained in one easily replaceable rotor assembly. —*De Laval Steam Turbine Co., Trenton, N. J.*

Teflon-Seated Valves

The needle, plug gate and sampling valves set forth in 4-page Bulletin 5 incorporate the

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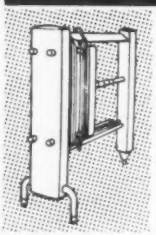

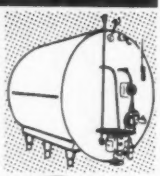

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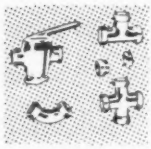

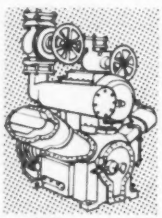

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following notable features: Molded renewable Teflon seats, outside stem threads, and union bonnet construction.—*Alloy Steel Products Co., Inc., Linden, N. J.*

Unscrambler Layouts

Series of drawings of unscrambling table, offered in five separate sheets, is designed to help in making layouts and installations on production lines.—*Island Equipment Corp., 27-01 Bridge Plaza N., Long Island City 1, N. Y.*

Materials Handling

Materials Handling Line

Condensed 8-page catalog contains basic specifications of line of materials handling equipment. Included are electric and gas-powered fork-lift trucks, towing tractors and trucktractor models for moving bulk materials.—*Clark Equipment Co., Battle Creek, Mich.*

Transmission Belting

Proper selection of flat transmission belting is aim of 8-page Bulletin 3678. It contains complete formulas, charts, and tables.—*Thermoid Co., Trenton, N. J.*

Fork Lift Overhead Guard

Designed to provide maximum protection for fork lift truck operators, new overhead guard device is announced in 2-page data sheet.—*Towmotor Corp., 1226 E. 152 St., Cleveland 10.*

Wire Conveyor Belts

Case histories of how woven wire conveyor belts have reduced materials handling costs are depicted in 4-page Bulletin 102.—*The Cambridge Wire Cloth Co., Cambridge 4, Md.*

Control Equipment

Small Plant Water Softener

Zeolite softening apparatus for small boiler and industrial plants (less than 100 gpm.) is described in Publication 4505. Single or double units are available with greensand, synthetic gel or resinous type zeolite.—*Cochrane Corp., 17 St. & Allegheny Ave., Philadelphia 32.*

Viscometer Adaptor for Low Ranges

A special viscometer attachment that makes possible precise measurements in ultra-low viscosity ranges is described in 2-page Data Sheet 034. When measuring viscosities within 0-10 centipoises, the adaptor makes reproducibilities within .02 centipoises obtainable.—*Brookfield Engineering Laboratories, Inc., Stoughton, Mass.*

Water Treatment Guide

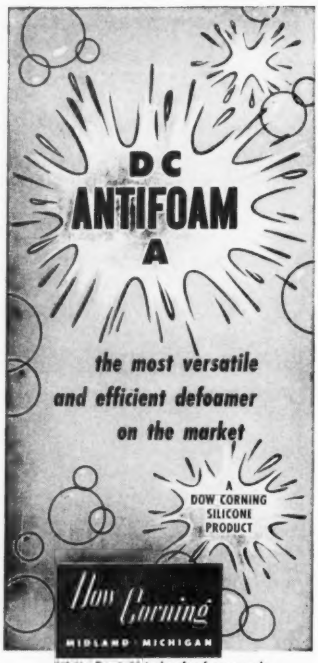
Explaining why various water troubles occur and how they can be eliminated, 12-page Bulletin 551 serves as a guide to correct water treatment for all phases of the food industry.—*Elgin Softener Corp., Elgin, Ill.*

New Liquid Meter

A new 2-in. positive displacement meter for industrial liquids, added to line of Xacto meters, is described in 4-page Bulletin 460. Developed for the 110-gpm. range, it has five vertical pistons.—*Bowser, Inc., Fort Wayne, Ind.*

Temperature Measurement, Control

Basic principles of industrial temperature and measurement control are detailed in 24-page Bulletin 101. Outlined are eight re-



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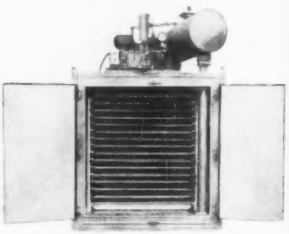

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sponses to temperature, five ways of putting that response to work, nine basic instrument types and, finally, evaluations of different systems.—*The Partlow Corp., New Hartford, N. Y.*

Plant Supplies

Lighting Fixtures

Complete line of fluorescent and germicidal lighting fixtures is presented in Catalog 47. New 4-ft. slim unit is included.—*Edwin F. Guth Co., St. Louis 3.*

Air Foam Fire-Fighting

For companies having large flammable liquid fire hazards, 24-page brochure details use of air foam, or mechanical foam, for fire fighting. It describes application methods, different types of foam compounds, playpipes, foam-proportioning tanks and fire apparatus types.—*Pyrene Mfg. Co., 560 Belmont Ave., Newark, N. J.*

Flexible Plastic Tubing

General information and applications of flexible plastic tubing, Tygon, are recounted in 24-page booklet.—*U. S. Stoneware Co., Akron, Ohio.*

Essential Oils Listing

Latest price list on essential oils, aromatic chemicals, colors, etc., is given in 12-page bulletin.—*Fritzsche Bros., Inc., Port Authority Bldg., New York 11.*

Surface Active Agents

New 8-page catalog covers surface active agents and organic chemical specialties and lists several new products. Brief description of each agent is given.—*Alrose Chemical Co., Box 1294, Providence, R. I.*

Miscellaneous

Automatic Pretzel Production

Fascinating story of pretzels, from early times up to present day mass-production methods, is told in words and pictures in 16-page booklet. It highlights the modern machinery now used and also suggests a plant layout.—*American Machine & Foundry Co., 485 Fifth Ave., New York 17.*

High Temperature Lubrication

Results of 18 months' research on high temperature lubrication are presented in 4-page folder. Oils to meet all conditions up to and over 500 deg. F. are detailed.—*E. F. Houghton & Co., 303 W. Lehigh Ave., Philadelphia 33.*

Apple Juice Preservation

Commercial preservation of apple juice is dealt with in Bulletin 487. Manufacture of jellies and preserves is treated in Bulletin 490. —*Oregon State College Puyallup, Wash.*

Deterioration by Canned Oxygen

How to determine the deteriorating effect of oxygen on liquid food in containers is aim of *Relationship of Headspace & Dissolved Oxygen in Liquid-Food Containers.* Two nomographs are reproduced in this 6-page folder.—*The Linde Air Products Co., 30 E. 42 St., New York 17.*

Yearly House Organ Ready

The 1950 edition of *Food* is now available to processors. Featured are stories of preparing honey, fruit spreads, vinegar and beverages. —*Mojonnier Bros., Co., 4601 W. Ohio St., Chicago 44.* —End

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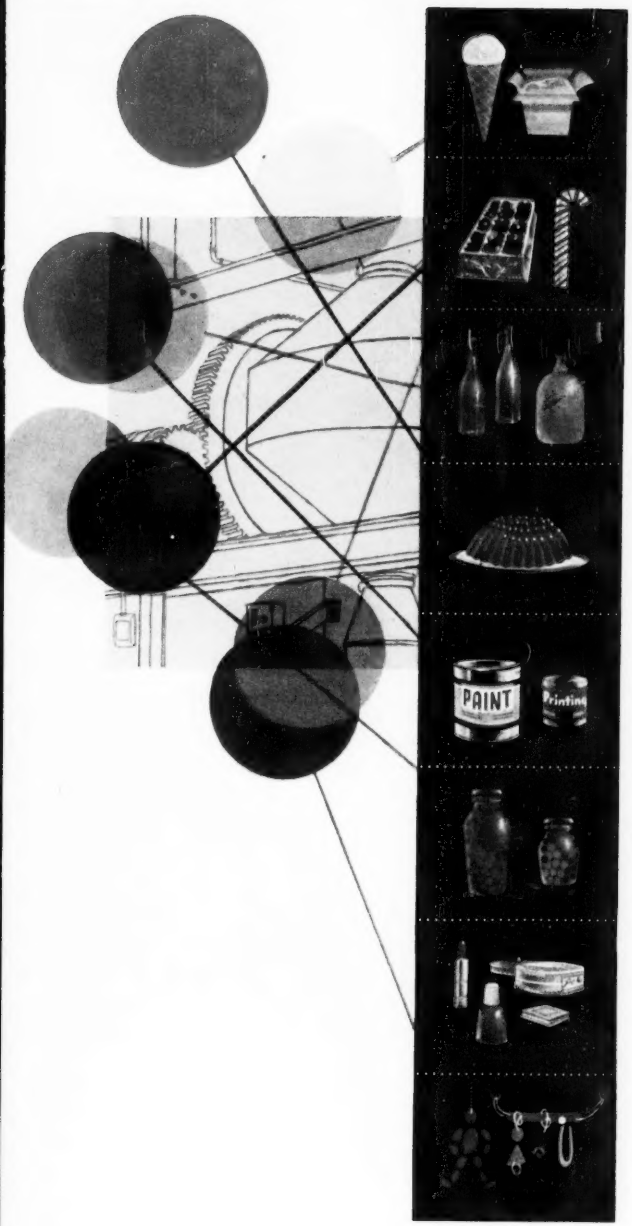

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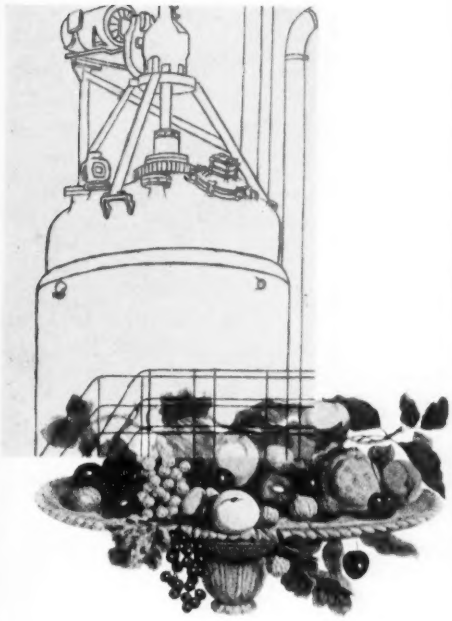

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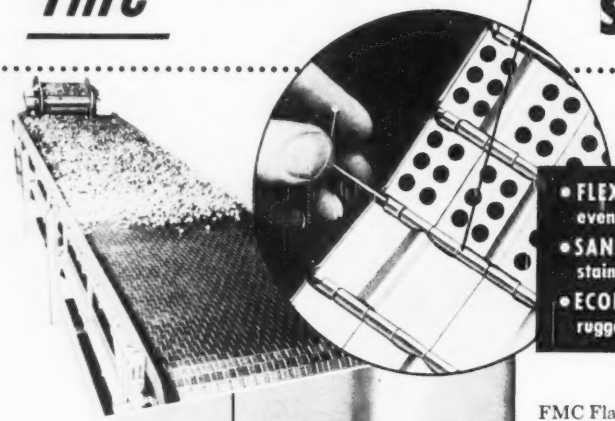

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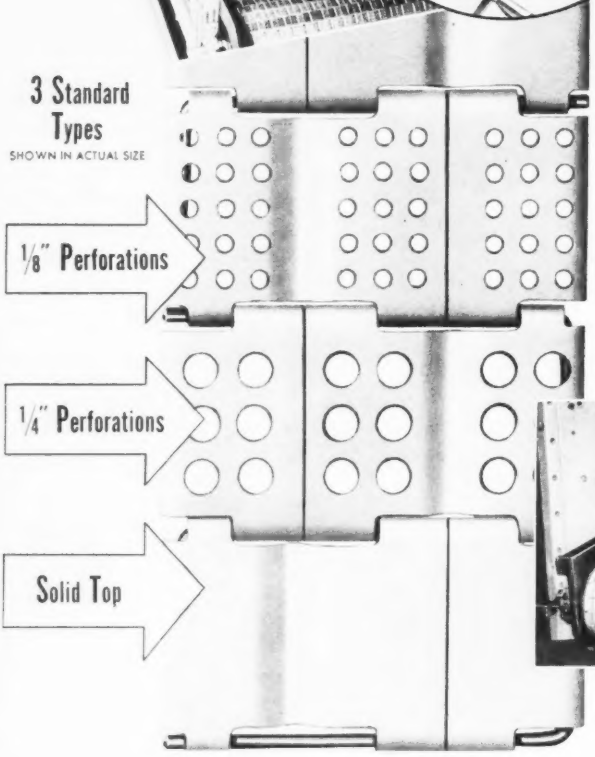

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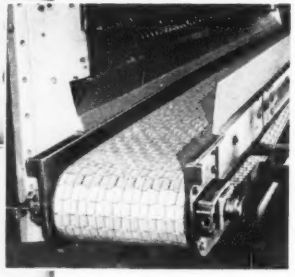

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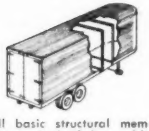

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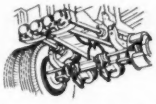

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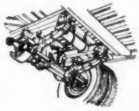
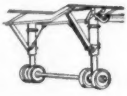


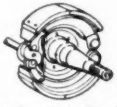
"Multi-Rate" Suspension gives better springing from no load to over-load.



Vertical 2-Speed Supports save time. Aluminum cuts weight up to 135 lbs.

Magnesium floors cut hundreds of pounds of dead weight . . . without sacrificing strength.

Aluminum wheels save up to 107½ lbs. per axle over conventional steel wheels.



Pressed steel brake shoes save 40 lbs. per axle . . . afford smooth stops with heaviest loads.

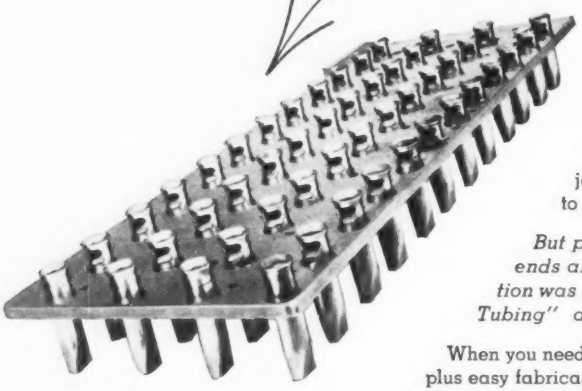
A full staff of qualified engineers are available to help you with special problems.

Sleek streamlined styling identifies your operation with the most advanced hauling equipment on the road.

80 Factory Service Branches, coast-to-coast, offer you the best Trailer service in the world.

Only FRUEHAUF World's Largest Builders of Truck-Trailers *builds STAINLESS STEEL TRAILERS!*

POPSICLE PRODUCER DEVELOPS NEW PRODUCTION IDEA with *Carpenter* Stainless Tubing



Exactly the right temper for swaging and flaring, and a good, bright finish, were the bonus features this food processor got by specifying Carpenter Stainless Tubing, Type 304.

When this mass production assembly for holding popsicle sticks was developed, the job called for "Type 304 Stainless Tubing" to meet sanitary requirements.

But problems in swaging and flaring the tube ends almost licked the idea. Then the specification was changed to "Carpenter *Type 304 Stainless Tubing" and fabricating problems disappeared.*

When you need the sanitary advantages of Stainless Tubing, plus easy fabrication because of uniformity in finish, tolerance and analysis, it will pay you to get in touch with Carpenter or your nearest Carpenter Stainless Tubing Distributor.

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This 12-page booklet will give you useful data about corrosion resistance, physical properties, sizes, heat resistance, etc. Write us a note on your company letterhead and ask for the Carpenter Stainless Tubing Data File.

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Patents

Oranges and Like Automatically Cut Into Sections and Forced Between Rolls Under Pressure for Recovery of Juice Content—*R. E. Hewlett to Hewlett Mfg. Co., Detroit. No. 2,515,772. July 18, 1950.*

Cocoa Butter Extracted From Chocolate Liquor With Propylene Glycol—*E. Palmer to Moorehead Mfg. Co., Inc., Baltimore, Md. No. 2,515,794. July 18, 1950.*

Highly Active Anti-Oxidant Extracted From Crude Vegetable Oil by Treatment With Ammonia Preliminary to Extraction With Highly Polar Solvent and Recovery of Solvent Solution—*L. O. Buxton, Maplewood, to Nopco Chemical Co., Harrison, N. J. Nos. 2,515,858-59-60. July 18, 1950.*

Black Irish Moss Converted to Commercial Product by Bleaching With 120 deg. F. Water to Remove Soluble Salts, Drying, Grinding to Pass Through 100-200 Mesh Screen, and Bleaching by Exposure to Sunlight in Thin Layers of About 1/16 In. Thickness—*A. E. Siehrs to Krim-Ko Corp., Chicago. Nos. 2,516,023-24. July 18, 1950.*

Fat Recovered From Fatty Tissue by Comminuting, Passing Quickly Over 300 deg. F. Heated Surface and Permitting Liberated Fat to Remain in Contact With Ruptured Cells to Allow Water Content of Fat to be Absorbed by Ruptured Tissues, Causing Water-Swollen Tissues to Float to Surface and be Separated From Fat—*C. Pavia, New Market, Va., to Pavia Process, Inc., Washington, D. C. No. 2,516,071. July 18, 1950.*

Wheat Starch and Gluten Separated by Adding ¼-3½ Percent by Weight Sodium Thiosulphate to Wheat Flour, Mixing With Enough Water to Form Batter, and Then Washing With Large Quantity of Water With Agitation to Remove Starch Content—*C. G. Harrel, J. T. Haigh, and R. O. Brown to Pillsbury Mills, Inc. No. 2,516,117. July 25, 1950.*

Vegetables Peeled in Power-Driven Hollow Drum With Interior Abrasive Surface and Rotating in Horizontal Plane—*J. B. Patterson, Wichita, Kans. No. 2,516,250. July 25, 1950.*

Proteins Extracted From Protein-Containing Material by Dissolving in Concentrated Aqueous Solution of Lower Alkyl Quaternary Ammonium Salt, Separating Solution and Diluting to Regenerate Proteins and Permit Their Separation From Solution—*W. J. Shibe, Jr., Andalusia, Pa. No. 2,516,531.*

Meat Mechanically Tenderized by Passing Between Pair of Cooperating Rolls Including Gang of Cutters on one Roll—*O. R. Deckert, Newtonville, Mass. No. 2,516,621. July 25, 1950.*

Oysters Opened by Stabbing With Collapsible Dagger—*L. A. Crowl and L. F. Gast, Baltimore, Md. No. 2,516,618. July 25, 1950.*

Cereal Starch Converted to Starch Ethers in Original Granular Form by Treatment With Alkylene Oxide—*C. C. Kesler and E. T. Hjermastad to Penick & Ford, Ltd., Inc., Cedar Rapids, Iowa. No. 2,516,632. July 25, 1950.*

Cereal Starch Converted to Starch Ethers in Original Granule Form by Treatment With Alkylene Oxide in Presence of Water-Soluble Salt of Alkali Metal or Alkaline Earth Metal to Give Desired Hydroxyl Ion Concentration—*C. C. Kesler and E. T. Hjermstad to Penick & Ford, Ltd., Inc., Cedar Rapids, Iowa. No. 2,516,633. July 25, 1950.*

Cereal Starch Converted to Cold Water Swelling Starch Ethers in Original Granule Form by Treatment With Mono-Functional Epoxide of Lower Aliphatic Hydrocarbon in Presence of Soluble Alkali—*C. C. Kesler and E. T. Hjermstad to Penick & Ford, Ltd., Inc., Cedar Rapids, Iowa. No. 2,516,634. July 25, 1950.*

Soya Oil Deodorized and Decolorized by Heating Under Less Than Atmospheric Pressure at 100-520 deg. F. to Remove Lecithin, Phosphatides, and Fatty Acids During Passage of Electric Current Through Spaced Electrodes Immersed in the Oil—*H. M. Unschuld, Chicago. No. 2,516,733. July 25, 1950.*

Vanillin Made From Lignin-Containing Substances by Action of Finely Dispersed Gas Containing Free Gaseous Oxygen in Alkaline Medium Using Copper Sulphate as Catalyst at Temperatures in Excess of 140 deg. C and Partial Pressure of Oxygen of Less Than 20 psi.—*H. B. Marshall, Toronto, and C. A. Sankey, St. Catharines, Ontario, to the Ontario Paper Co., Ltd., Thorold, Ontario, Canada. No. 2,516,827. July 25, 1950.*

Cellular Juicy Food Given Layer of Starch-Conversion Syrup Solids in Dry Finely Divided Form Prior to Freezing.—*R. L. Lloyd, Port Washington, N. Y., to American Maize Products Co. No. 2,516,891. Aug. 1, 1950.*

Ice Cream Mixed or Softened by Action of Whipping Device Mounted Within Bottom

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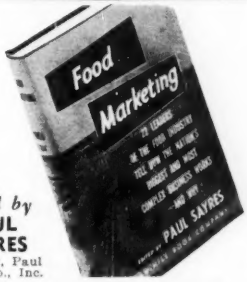
22 leaders of the FOOD industry
tell the inside story
of successful food marketing

JUST OUT



Edited by
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FOOD MARKETING

340 pages, $5.00

How does the staggeringly large volume of foodstuffs consumed in America reach its users? What parts and activities make up the industry, the largest in the country, that performs this huge task of distribution? Now, for the first time, the gamut of food industry practice is covered thoroughly and intimately by 22 leaders, specialists representing the country's major food manufacturing and distributing companies and trade associations.

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Supers Are Here to Stay
Shelf Space for Fast Movers
Coast Retailer-Owned Wholesalers Prosper
No More "Company" Stores
What About Wagon Selling?
Voluntaries Make "Hay"
Wholesalers Modernize, Merchandise
Evolution Hits the Food Broker
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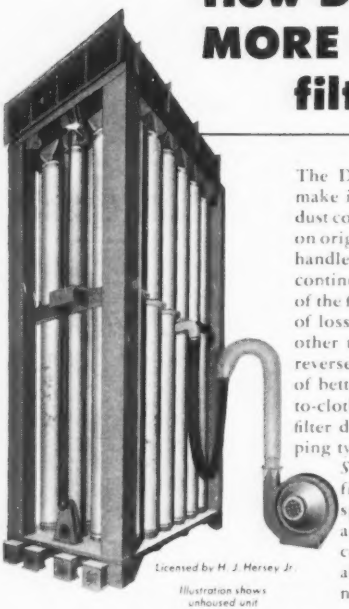
How DAY gives you MORE for your dust filter dollar



Licensed by H. J. Hersey Jr.

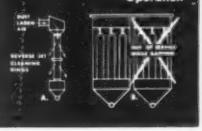
Illustration shows unhoused unit

The DAY Type "AC" Dust Filter helps make important savings two ways in your dust control program. *First:* you save money on original cost because you buy *less* filter to handle *equal* volumes of air. With DAY's continuous-automatic operation, only 1¼% of the filter cloth is lost for cleaning instead of losses up to 50% which occur in most other types of filters. Also, DAY's gentle, reverse air-jet cleaning action permits use of better filtering fabrics for a greater air-to-cloth ratio. Thus *less* cloth and a *smaller* filter do the same job as much larger rapping type units.

Second: economy stems from the DAY filter's compact design. Less floor space is needed and installation costs are minimized. Its simple, rugged construction gives years of dependable service at rock-bottom maintenance costs . . . economy all the way.

THESE ADVANTAGES MAKE THE DIFFERENCE

1. Continuous-Automatic Operation



A. Reverse air-jet cleaning rings travel up and down the tubes of a DAY filter, constantly cleaning the cloth.

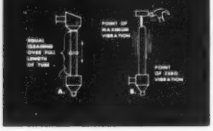
B. Most other types of filters must shut off a complete section for cleaning or rapping. This may amount to 50% of the cloth area.

2. Constant Air Volume

A. Back pressure rises slightly when the DAY filter is first started, then levels off and remains uniform. This assures the constant air volumes necessary for efficient dust collection.

B. Sharp back pressure and air volume variations occur in rapping type filters when sections are shut down for cleaning.

3. High Cleaning Efficiency



A. The DAY reverse air-jet cleaning mechanism is gentle yet positive, cleaning each tube uniformly and permitting the use of high efficiency felt filtering cloth.

B. Tougher cloth with resultant poorer filtering must be used in rapping type filters. Cleaning effectiveness varies widely from point of vibration to where cloth is attached to filter.

Other Important Advantages

Separated Dust Streams — One DAY Type "AC" Dust Filter can handle several different product streams simultaneously without mixing . . . thus doing the work of several individual units.

No Dust-Catching Ledges—DAY filters have no flat surfaces or ledges where dust can collect and become contaminated . . . no places to encourage infestation.

GET THE COMPLETE STORY

Write-to-DAY for Bulletin 491

SINCE 1881

The **DAY** *Company*

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IN CANADA: P. O. BOX 700, FORT WILLIAM, ONTARIO

BRANCH PLANTS IN FT. WORTH, BUFFALO AND WELLAND, ONTARIO

of Container to Form Basket Structure by Which Relatively Hard Pieces of Ice Cream May be Broken Into Smaller Pieces—*M. C. Luterick, Montrose, Calif., to Diced Cream of America, Los Angeles.* No. 2,516,895. Aug. 1, 1950.

Blood Flushed From Carcass of Slaughtered Animal With Heated Edible Salt Solution to Maintain Normal Body Temperature in Carcass and Prevent Contraction and Collapse of Circulatory System Preliminary to Injection of Melted Fats to Replace Blood and Salt Solution—*O. E. Schotte, Amherst, Mass.,* 52½ Percent to Trustees of Amherst College. No. 2,516,923. Aug. 1, 1950.

Fruits Pitted by Centrifugal Force—*F. Derbenwick, Oakland, J. F. Ryan, Jr., San Leandro, and N. C. Calhoun, Oakland, Calif., to Gerber Products Co., Fremont, Mich.* No. 2,516,963. Aug. 1, 1950.

Brewers Sirup Made to Consist of Molasses From Acid Conversion of Wheat Flour After Removal of Crystallized Dextrose Containing all Solubles in Wheat Flour and Soluble and Insoluble Wheat Protein and Virgin Syrup Resulting From Acid Conversion of Starch Slurry—*J. F. Walsh, Holland, Mich., D. M. Levitt, Great Neck, N. Y., and A. H. Goodman, Holland, Mich., to Doughnut Corp. of America, New York City.* No. 2,517,148. Aug. 1, 1950.

Wheat Gluten Mechanically Separated From Starch Slurry by Mechanical Action Upon Wheat Flour Dough to Facilitate Hydration of Gluten Through Formation of Long Glutenous Strands Preliminary to Addition of Additional Water to Wash Gluten Free of Starch and Subdivide it Into Curds Without Intervening Handling—*J. F. Walsh, Holland, Mich., D. M. Levitt, Great Neck, N. Y., and A. H. Goodman, Holland, Mich., to Doughnut Corp. of America, New York City.* No. 2,517,149. Aug. 1, 1950.

Poultry Dressed With the Aid of Tongs to Facilitate Evisceration—*J. D. Bennek, Milwaukee, Wis.* No. 2,517,168. Aug. 1, 1950.

Food Material Blanched in Continuous Manner by Recirculation of Blanching Medium and Venting Blanching Chamber to Atmosphere at Beginning of Blanching Period on Controllable Recirculating Cycle—*I. F. Plummer, Jr., Phillipsburg, N. J., to Ingersoll-Rand Co., New York City.* No. 2,517,236. Aug. 1, 1950.

Eggs Mechanically Sorted Within Adjustable Weight Ranges—*C. Page to Page & Cox, Detroit, Mich.* No. 2,517,341. Aug. 1, 1950.

Stones Mechanically Removed From Fruit by Action of Endless Feed Belt Running Over Drum With Parallel Partitions Overlying Belt and Extending Vertically Down Side of Drum With Circular Tooth Cutters Operating Between Each of Partitions and Vertical Strip or Plate—*H. Pesch, Fayetteville, N. Y., to Continental Can Co., Inc., New York City.* No. 2,517,342. Aug. 1, 1950.

Collagen-Containing Material Prepared for Manufacture of Gelatin by Washing With Circulating Water Aided by Stream of Air at Relatively High Velocity Until Particles of Collagen Material are Substantially Free of Extraneous Material Preliminary to Circulation of Cooking Liquor Heated by Injection of Steam Until Solution of Solubles Reaches Desired Concentration and is Free of any dissolved Blood.—*I. E. Hill and N. C. Hill, Akron, Ohio; I. E. Hill to N. C. Hill.* No. 2,517,487. Aug. 1, 1950.

NOW—Simpler, Faster, Automatic Titrations!

The BECKMAN Automatic TITRATOR

Here's another new Beckman advancement in instrumentation—*an instrument that runs your titrations for you.* It's the Beckman Automatic Titrator—the instrument that makes accurate titrations more rapidly and conveniently than by manual methods.

SIMPLE OPERATION: In a series of titrations, simply fill the burette, place the sample in the beaker—and the Beckman Automatic Titrator takes over from there. Raising the beaker holder into position automatically starts the stirrer motor and begins delivering titrating solution into the sample.

A special circuit electrically anticipates the approaching end point, scaling down delivery of the titrating solution in progressively smaller increments to assure a highly accurate titration. When the end point is reached, delivery of the titrating solution stops and a light shows completion of the titration—*all automatically and without attention from the operator.*

Whether your laboratory is large or small the Beckman Automatic Titrator provides important advantages in your titrating operations . . .

- *It releases the technician during titration, enabling him to perform other operations such as preparing samples, or calculating results.*
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- *It gives objective, reproducible results . . . eliminates errors due to personal factors.*
- *It provides time-saving conveniences for sample handling.*

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ALSO A RELIABLE pH METER—the Beckman Automatic Titrator can also be used as an AC-powered pH meter to give accurate readings over the range 0 to 14 pH, as well as millivolt readings from −600 to +1400 mv.

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Citrus Fruit Mechanically Centered for Juice Extraction—*H. L. Wurgaft, Fullerton, Calif., to F. S. Markham and M. G. Markham.* No. 2,517,519. Aug. 1, 1950.

Citrus Fruit Freed of Juice and Pulp by Action of Plurality of Rotary Reamers Operating Over Apertured Plate in Registration With Reamers —*H. L. Wurgaft, Fullerton, Calif., to F. S. Markham and M. G. Markham.* No. 2,517,520. Aug. 1, 1950.

Food Products in Sealed Containers Rotated Through Vertical Plane During Retorting to Provide Agitation and Rapid Transfer of Heat to Center of Container—*L. V. E. Clifcorn, G. T. Peterson, and J. M. Boyd, Chicago, Ill., to Continental Can Co., Inc., New York City.* No. 2,517,542. Aug. 8, 1950.

Fruit Juices Extracted and Processed to Retain Original Flavors and Food Value—*Erich Gustav Huzenlaub, Brentford, England.* No. 2,517,569. Aug. 8, 1950.

Food Encased in Edible Envelope Consisting of Calcium-Alkali Pectinate Film Derived From Pectinic Acid Having Methoxyl Content of 3-8 Percent—*H. S. Owens, Berkeley, and T. H. Schultz, Lafayette, Calif., to United States of Amer.* No. 2,517,595. Aug. 8, 1950.

Glutamic Acid Crystallized From Hydrolysate Mixture—*R. W. Shafor, Los Gatos, and F. H. Catterson, San Jose, Calif., to International Minerals & Chemical Corp.* No. 2,517,601. Aug. 8, 1950.

Frozen Confection Made by Flowing Ice Cream Mix Into Compartments Consisting of Plurality of Biscuits in Spaced Relation to Each Other Preparatory to Closing Container and Freezing Contents—*G. A. Zabriskie, III., New York, and F. Zabriskie, Brooklyn, N. Y., to Airline Foods Corp., New York City.* No. 2,517,756. Aug. 8, 1950.

Vegetables Blanched During Passage Through Elongated Trough Equipped With Feeder at Head End, Spillway at Discharge End, and Means for Heating Blanching Medium—*W. A. Ten Eyck to Bercut-Richards Packing Co., Sacramento.* No. 2,517,942. Aug. 8, 1950.

Coffee and Other Granular Foods in Containers Gassed by Applying Current of Treating Gas Under Pressure to Material in Central Zone of Container—*W. M. Tomkins, Hinsdale, Ill., to Continental Can Co., Inc., New York City.* No. 2,518,100. Aug. 8, 1950.

Lollipops and Like on Sticks Mechanically Wrapped so as to Apply Wrapper to Whole of Comestible and Portion of Stick—*H. J. Wahlers, Bloomfield, N. J.* No. 2,518,101. Aug. 8, 1950.

Cheese Shaped in Mold Consisting of Plurality of Closed Chambers to Handle Number of Individual Cheeses in Single Pressing Operation—*F. Ryser, Chicago, Ill.* No. 2,518,188. Aug. 8, 1950.

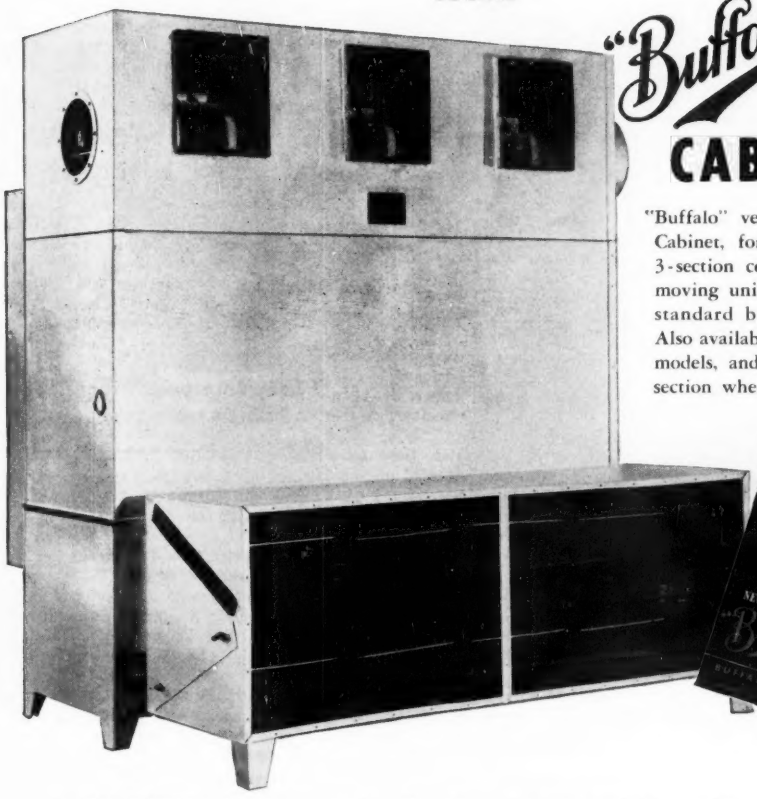
Anti-Oxidant Made to Contain Amino Acid, Gallic Acid Ester, and Benzoic, Fumaric, Tartaric, or Citric Acid as Synergist—*L. A. Hall, Chicago, Ill., to The Griffith Laboratories, Inc.* No. 2,518,233. Aug. 8, 1950.

Starch Simultaneously Hydrolized and Hydrogenated to Sorbitol by Treatment With Water, Magnesium Chloride, and Hydrogen in Presence of Nickel-Kieselguhr Catalyst Under 100 Atmospheres Pressure at 200 deg. C.—*Lenze Hartstra, Lubertus, Bakker, and Hendrik Adriaan van Westen, Badhuisweg, Amsterdam, Netherlands, to Shell Development Co., San Francisco, Calif.* No. 2,518,235. Aug. 8, 1950.

—End

YOU CAN CONTROL

YOUR PLANT'S CLIMATE with "Buffalo" PC CABINETS



"Buffalo" vertical model VPC Cabinet, for floor installation 3-section construction permits moving unit in easily through standard building openings. Also available in horizontal PC models, and with Air Washer section where desired.

- COMPLETE climate control! Simple cooling — and de-humidifying — heating and humidifying — continuous air cleaning — all are practical with PC Cabinets as part of your system.
- Any desired combinations — may be automatically controlled.
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BUFFALO FORGE COMPANY

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Canadian Blower & Forge Co., Ltd., Kitchener, Ont. Branch offices in all Principal Cities

VENTILATING FORCED DRAFT | AIR WASHING COOLING | AIR TEMPERING HEATING | INDUCED DRAFT EXHAUSTING PRESSURE BLOWING

Label Redesign: Don't Ignore the *Labeler*

—*Continued from page 78*

hooks, around the periphery. On this sketch, the fingers are represented as small semi-circles. Note, in studying the box, that the outer edges of the label held by it can be appreciably altered, provided the portions of the label on which the contact fingers rest are left intact.

Now, look at the other drawings. They show only three of the many possible shapes that may, without alteration of the fingers, be chosen in redesigning a label or initiating a new one. Only minor changes may be necessary to apply glue on the corners of the label, but these simple adjustments can be made by a shop maintenance crew. With these few suggestions showing the way, the average small processor can evolve something new and distinctive to suit his needs and individual tastes.

Selecting Colors

After determination of the mechanical size and shape of the label, there are, of course, the major design considerations initially mentioned—the factors to make the new package a stimulus toward greater sales.

Color plays a vital role. It is common knowledge that individuals have certain color preferences. In some cases, however, extreme colors may attract the customer's attention, and yet, fail to induce a desire to buy.

Perhaps the best advice one can give on color selection is this: Evaluate the hues as to whether they are pleasant to the eye, legible, and sales appealing. The emotions of the buyer are stimulated through label colors—which, in effect, can be soft, loud, mellow, vibrant, rich, cool, or hot. Before making a final decision, test several color designs on your own plant personnel as a measure of popular reaction.

Points on Typography

In planning label design, give considerable attention to typography—the real pay-off on product identification. Type faces should be chosen from the five basic forms. The layout should convey the feeling of quality. Remember, keep the design simple. It must lend itself to reproduction both in color and in black and white. And it must not lose its identity, even though reduced to one-fourth its normal size.

When confronted with problems of art and good taste, your designer or advertising agency can be of great assistance. These specialists are well aware of the sales appeal that can be "built into" the new package label.

There are many top-notch professional designers whose label redesigning ability cannot be surpassed. They can develop a new design to achieve maximum sales results with a minimum effort and expense, and their services should be utilized whenever practical.

A comparison of two or three dozen nationally-known bottled products leads to surprising conclusions about current packaging practice. Some of the poorly-designed packages are carry-overs from years gone by. Here, the processors have not wanted to upset the status quo, because they believe the prestige and identity of their products are firmly established in the public mind.

Changing the design of a bottle label on an established product is always a delicate problem, and it should be cautiously done. When a change is imperative—to cope with strong competition from other progressively designed packages or where it is desirable to go after the younger generation's business—the departure from the old to the new label should be gradually made.

Through the transition, there must be some unmistakable thread of identification, which can be retained with the original colors, certain design characteristics, name alone, or the logotype. Usually, the design department can accomplish the change-over in a subtle manner so as to reassure old customers that the product is the same. Otherwise, many faithful customers may be lost.

In any event, packages which have adhered to an old label can be given a new dress without endangering distinction, prestige, or the familiarity established through years of successful promotion.

Dressing up a package for greater eye appeal is sound merchandising. In today's competitive market, impulse sales due to standout package design can run to a worthy figure. This is of the utmost importance in the bottled goods field, for here the label must catch the eye and sell the brand name.

Needn't Break the Budget

There are, of course, two main reasons for new labels—to give extra sales impetus to a product, and to introduce a new product. Must the cost of a new package be prohibitive to a small manufacturer? Not at all. Yet, we have come across instances where companies have retained outmoded labels because they believed package re-designing would be considerably out of line with their sales budgets.

Other organizations have done exactly the opposite. They have designed new labels with no attention to expense. And, naturally the increased cost cut a drastic swath in their ledgers.

Between these two extremes, several other courses are open to the alert manufacturer who gives his imagination free rein while keeping a weather eye on costs. Examples and suggestions already cited may show the possibilities open to him. His imagination can do the rest.

Consider the case of the small processor who wants to make a change in his package design but lacks funds to cover major alterations in his set-up. Though he may not realize it, he can alter the appearance of his package so radically that it will be a dramatic boost for his own organization and in the trade. Yet, this new look may be achieved with a very minimum of machine changes.

End (Resume reading on page 79)

They Improved Processing

—*Continued from page 88*

there has been no belt slippage. Moreover, no maintenance has been required and no V-belt has been replaced.

6—Device Cuts Fatigue. After retorting and cooling, some retort crates are emptied onto unscramblers feeding labeling machines. Other crates are emptied by hand and the unlabeled cans filled into cases. Here, lifting the filled cases onto a trunk conveyor was a very tiring task for the workers. But this excessive demand on muscle has been minimized by providing a case-filling platform. It is made of a section of a conveyor and fitted with small ball-bearing rollers. Using this platform, a slight push now transfers the filled case to the trunk conveyor with little effort.

7—Boiler Cleaning Reduced. The plant is in the limestone section of Wisconsin. Water from deep wells is very hard. Even the water from a long abandoned lime stone quarry is so hard that the boilers using that water for steam generation had to be shut down each week for cleaning. Today, however, installation of a water purification system, including a continuous draw-off, has minimized water hardness to the extent that one boiler can now be operated through the production season without shutdown for cleaning.

Stainless requires careful selection, too!

Before you marry your product to stainless steel, make certain that you've chosen the right analysis. *Stainless* is a broad term applied to a whole host of steels, each with its own characteristics. And to get the most out of stainless you must select with care.

That's why Crucible, a pioneer in the development of this specialty, offers you the services of a staff of metallurgists, well qualified by experience with hundreds of applications, to help you put stainless to work properly.

For more than half a century, Crucible has been the leader in the specialty steel field. There is no substitute for Crucible background — take full advantage of it. When you think of stainless — call in Crucible. CRUCIBLE STEEL COMPANY OF AMERICA, Chrysler Building, New York 17, N. Y.

CRUCIBLE first name in special purpose steels

51 years of Fine steelmaking

STAINLESS STEELS

STAINLESS • HIGH SPEED • TOOL • ALLOY • MACHINERY • SPECIAL PURPOSE STEELS

8—Practical Waste Disposal. Effluent liquor from beet and carrot canning is not only large in volume (6,000 gal. per hr) but is also high in dissolved organic matter. Disposal was doubly difficult at this plant because there is no nearby stream or body of water to receive a purified effluent after treatment. The problem was solved by a practical method developed on the job.

First, the bulk of the solids in the waste is removed by vibrating screen separators. The effluent is then transferred to a tank where the residual solids rise to the top to form a crust. This crust is kept at a uniform level. Liquor is drained from below to the first of a series of eight terraced hillside flumes.

Should the top flume overflow, the liquor will run into the flume below, and so on down the terraces. In normal operation, however, liquid is present in several of the upper flumes due to natural—and purifying—filtering through the earth. The terracing provides ample surface for evaporation. And there is surprisingly little odor resulting from this system.

New Moisture Test Gives Better Results

—Continued from page 85

40-ml. sintered-glass crucible of fine porosity. Tap the crucible so that finer particles will go to the bottom and retard the flow of liquid. Use drying tubes filled with 10-20 mesh Drierite to protect the desiccant from atmospheric moisture. Wrap the stoppers on the tubes with metal foil to protect them from solvents.

3. Quickly weigh the crucible without the drying tubes and then replace them. If the atmospheric humidity is high, place the crucible containing Drierite in a tared, covered dish while weighing.

4. Filter the prepared samples through dry Fiberglas into small Erlenmeyer flasks with ground-glass stoppers.

5. Pipette the aliquots (5 ml. or less) containing 250-500 mg. of water into the crucible containing Drierite, distributing well over the surface of the absorbent, and then replace the drying tube. Allow to drain—using no suction—until the bulk of the liquid has passed through. Apply gentle suction to get rid of excess liquid.

6. Wash samples five times with methyl alcohol, using 5 ml. each time. While employing light suction between washes, make certain that the stoppers are tightly inserted into the crucibles so that all of the air passes through the drying tube.

7. Wash at least three times with ethyl ether or low-boiling petroleum ether. Employ gentle suction for about 1 min. to avoid an oven explosion.

8. Remove the drying tubes and heat the crucibles in a forced-draft oven at 140 deg. F., until there is no ether odor. The time required will be approximately 5 min.

9. Replace drying tubes, cool to room temperature, and weigh. The increase in weight, corrected by a blank, represents the water in the aliquot of the sample analyzed. The blank represents the increase in weight of crucibles containing the same amount of Drierite and carried through all of the steps with the same amount of solvent, but without addition of the sample.

After weighing, heat each crucible containing Drierite to regenerate the absorbent, which is then ready for re-use.

A word now about two of the reagents: If Drierite has been exposed to moisture, it can be regenerated by heating for 2 to 3 hr. at 464 to 473 deg. F. It then should be bottled hot and sealed tightly. Absolute methyl alcohol is distilled from Drierite in a system protected from atmospheric moisture. A few magnesium ribbons are added to the flask to help prevent bumping during heating.

Checking Results

Data obtained by this new desiccant method and by the old oven technic were compared. In the oven procedure, samples were weighed in tared glass dishes and dried at 140 deg. F. in a forced-draft oven until most of the liquid was evaporated. Before the residue hardened, the weighing dishes were transferred to a vacuum oven and the drying continued for 40 hr. at 140 deg. F.

The results obtained were in close agreement, as shown by data in the table (lower left).

As a further check on the new method, a solution of water in methyl alcohol was prepared. Using aliquots containing 500 mg. of water, the following replicates were obtained: 498.5, 499.0, 497.3, and 498.7 mg. of water.

Acknowledgment is made to John Brekke and Everett Wolford who furnished the purees, and to Lee Walker, who supplied the juice concentrates. All three are associated with this laboratory.

End (Resume reading on page 89)

New Way "Agrees" With Old

HOW WATER CONTENTS of Drierite-Analyzed Juices and Purees Check With Vacuum-Oven Determinations

Material	Absorption Method		Oven Method	
	Percent Moisture	Average	Percent Moisture	Average
Orange molassee	26.7, 26.1, 26.8, 26.8	26.6	26.5, 26.5	26.5
Orange-grapefruit molassee	24.3, 24.8, 24.9, 24.9	24.7	24.6, 24.6	24.6
Strawberry puree	93.5, 93.2	93.3	93.8, 93.9	93.8
Strawberry puree	65.3, 65.1	65.2	65.4, 65.4	65.4
Strawberry puree	92.6, 92.6	92.6	92.8, 92.8	92.8
Raspberry puree	88.7, 88.8	88.7	89.1, 89.2	89.1
Apricot puree	86.3, 86.0	86.1	86.4, 86.4	86.4
Peach puree	71.2, 71.4	71.3	71.4, 71.4	71.4
Pear puree	63.1, 63.0	63.0	63.3, 63.3	63.3
Apple juice concentrate	50.6, 51.2, 51.0, 50.6, 50.7	50.8	51.0, 51.0	51.0
Grape juice concentrate	57.4, 57.4, 57.5, 57.5, 57.3	57.4	57.7, 57.7	57.7

This Truck's Engine

—Continued from page 83

combination. The rear axle is also optional as to make as well as to type, including a single or dual drive and a single or two-speed design.

For steering, a conventional bus and truck type stationary front axle is available on all models. However, for dual front wheels, a manually-operated type utilizing the Fruehauf fifth-wheel and a hydraulic booster may be had to provide a turning radius of 39 ft. 6 in. on the 35-ft.-overall vehicle.

Points for Propane

The Twin Coach Co. pioneered and is now manufacturing a complete line of propane buses, and it recommends use of a propane engine on the Super Freighter because of fuel savings. Advantages claimed include a saving of up to 2c. a mile in fuel cost and an increase of up to 50 percent in the time between engine overhauls. The liquid gas also eliminates the obnoxious gasoline exhaust fumes, important in handling loads of food products, which might absorb such odors.

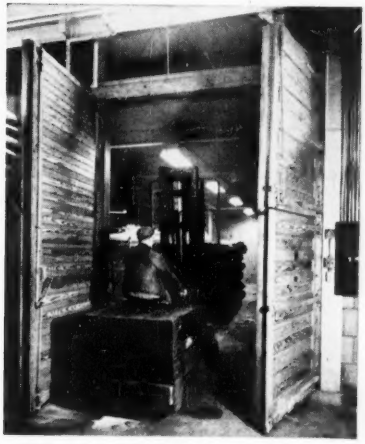
Because the supply of propane is

JAMISON Doors Open Wide at CANADA DRY

to speed materials handling

This double cold storage door with an opening 9′ x 12′ permits the entry of loaded fork lift trucks and the moving of equipment into the refrigerated processing space. For entry of personnel, the lower part of the right hand door can be opened without opening the rest of the door.

Whether you have unusual size requirements such as those illustrated or merely require a standard cold storage door, there is a Jamison door to fit your needs.



For full information on the Jamison line of cold storage doors, write for Catalog 175.

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HAGERSTOWN, MARYLAND, U. S. A.

The leader for over 50 years

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practically unlimited and is not a critical war material, it is likely to remain unrationed during even severe emergency periods.

Another design advantage of the Super Freighter is the exceptionally large road visibility from the driver's compartment. The windshield glass extends for practically the entire 8-ft. width of the trailer body. Claim is that it provides greater driver visibility than on any other vehicle now on the road.

The driver's compartment is also exceptionally roomy. Its height is 7 ft. 8 in., the same as the inside of the trailer body. Thus there is space directly above the head of the driver that may be used either for a sleeping compartment or for carrying an additional load.

End (Resume reading on page 84)

Chemicals vs. Foods

—Continued from page 51

over long periods of time, while drugs are taken by fewer individuals and under supervision of a physician.

He reported results of feeding tests with hamsters, using two polyoxyethylene monostearates and same percentages of prime steam lard. The animals fed the polyoxyethylene monostearate diets were reported to exhibit nutritional and histological abnormalities, whereas those fed the lard diets did not.

Henry R. Kraybill, director of research and education, American Meat Institute, stated his belief that every food processor has a moral responsibility not to change the food supply by chemical processing or addition of new chemicals without first determining that the changes will neither impart harmful or toxic properties to the food, nor impair its nutritive value. The studies should include short term, medium term, and long term tests. The tests should also be applied to foods to determine results of residues from use of pesticides, plant hormones, and defoliation agents.

Dr. Kraybill recommends that revisions to the FD&C Act provide clear and definite statements of the requirements necessary to secure approval for the addition of a chemical to food. Also, provisions should be included to prevent possible arbitrary rulings by the Administrator. Otherwise, there is great danger of retarding progress in food processing. He submitted data covering toxicity studies in the laboratories of the American Meat Institute Foundation on butylated hydroxyanisole as an antioxidant for fats and oils.

Anton J. Carlson, professor emeritus of physiology, University of Chicago, was asked by Counsel Kleinfeld what he concluded after reviewing data collected at bread standards hearing. His reply was that much more work had to be done. He believes burden of proof of toxicity should first come from industry and that consideration should be given to the possibility that chemicals can detract from the nutritive value of food without being toxic.

Dr. Carlson stated that he thought that bread softeners should not be used until much more extensive tests had been made to prove conclusively that their use involved no injurious long-range effects. He doubts the need for bread softeners at all. He is in favor of an agency to pass on submitted data and to check any differences of opinion to be drawn from the test data. He cited the National Research Council of the National Academy of Sciences to be an agency already in existence that could perform that function if permitted to do so.

A. C. Ivy, vice-president, University of Illinois, and professor, University of Illinois Medical School, Chicago, thinks that proof of safety by the manufacturer is a necessity before use of new chemicals in foods is permitted —more so than when intended for use in drugs. He held the same attitude toward insecticides and pesticides.

He stated that he does not know of any instance where chemicals in foods have aggravated disease conditions in the human body, not even in connection with Agene aging of flours. However, he believes that a conservative and safe attitude should be taken as a matter of precaution.

End (Resume reading on page 52)

You Can Double Output

—Continued from page 49

matically onto a dolly, mounted on casters. Finally, the marshmallow is manually dumped into the stainless steel hopper that feeds the filling machine.

Some of the Safeguards

Many precautionary measures have been taken in the mixing room. Air conditioning and dehumidifying units have been installed to maintain the proper temperature and relative humidity in the mixing room. Thus, a uniform-quality product is made, regardless of weather conditions.

The mixing room features special viewing windows through which visitors may watch the process. Two sides have Thermopane windows that make the entire room visible while at the same time maintaining proper insulation. Walls and floor are constructed of tile that is acid-proof and moisture-proof. The glossy easy-to-clean cement joints are also acid-proof and moisture-proof. The ceiling is covered with a high-gloss, fungicidal paint.

Light fixtures in the mixing room are rubber-gasket sealed, and they are designed so that they can be readily washed by a hose. All metal parts in the room—door, window sash, egg-white mixing tanks, mixing bowls, and also the air conditioning and dehumidifying outlets—are built of stainless steel.

Outside of the filling and capping room, cartons of empty jars are removed from a conveyor and dumped onto an unscrambler that, in turn, feeds them onto a belt that takes them through jar-cleaning and sterilizing units. Empty cartons then travel along another belt to the automatic case packer.

Before entering the cleaning device, empty jars are inverted by a twister. From jets, air under 85 lb. pressure blows loose lint and other extraneous matter from the jars. Then, by means of two vacuum jets, any remaining foreign matter is sucked out.

Sterilization of the jars is next. Empties are mechanically turned right-side up and continue through a small opening into the filling and capping room, where they pass under a battery of 3-ft.-long ultraviolet lamps.

This air-conditioned room is under slight positive air pressure to keep dust and any flying insects from entering through the small conveyor openings. Like the mixing room, walls and floor are sanitary-tile surfaced. All equipment in contact with the food is made of stainless steel. Lamps are sealed, and the ceiling is covered with a fungicidal paint.

Advanced Packing Units

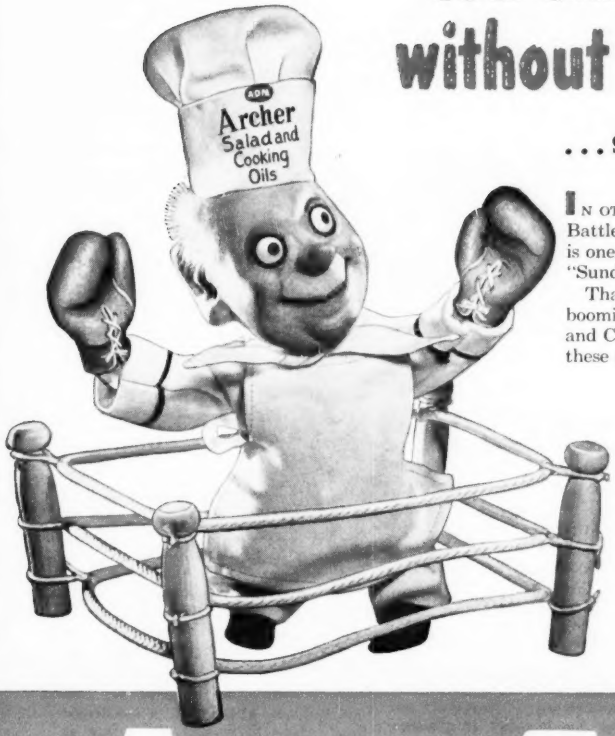
Fifth output-increasing change was installation of high-speed machines on the glass-packing line. Jars were formerly filled at the rate of 60 a min. Now they go through a six-piston filler that handles 125 a min. A four-headed, Pneumatic Scale capper that applies 125 caps per min. to the jars has replaced the former single-headed unit.

Precautionary steps are taken before jars and lids reach the capper. Jars leaving the filling machine pass under another series of ultraviolet lamps for sterilization of the surface of the product and the top of each jar. And caps are cleaned to keep loose paraffin and pieces of waxed cap liners out of the product.

Before reaching the capper, lids fall through a covered stainless steel chute, pass over a grid, and then go to a

"You can't make hay without a haymaker!"

...says Archie, the chef



IN OTHER words, what Archie is saying is that the Battle of Quality in the food business is one that never ends. Today you need a real "Sunday punch" to stay in the ring.

That, we think, is the number one reason for the booming sales of ARCHER Soybean Salad and Cooking Oils. Introduced just a year ago, these oils have proved that *extra* purity, *extra* uniformity, *extra* delicacy of flavor have an instant effect on consumer acceptance.

Would you like specific proof of the advances made by ADM in the processing of edible soybean oils? If you can't get down to Decatur to see our ultra-modern new plant in operation, why not do the next best thing? Mail the coupon below. Let us send you samples of ARCHER "S" (salad oil) and ARCHER "C" (cooking oil). Then judge for yourself what ARCHER'S super-quality can do for your sales and profits.

Archer

SOYBEAN SALAD *and* COOKING OILS

Taste THEM
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Want to see for yourself? Just mail the coupon today.

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Please send sample of ☐ ARCHER "S" Soybean Salad Oil
☐ ARCHER "C" Soybean Cooking Oil.

*Name*_____

*Company*_____

*Address*_____

*City*_____ *Zone*___ *State*_____

rotating disk. Any foreign matter drops into a pan below the grid and a container at the bottom of the disk. The fall of the caps through the chute is retarded by a spring-operated flap.

Capped jars then leave the filling and capping room, being twisted to a rolling position before going to a Standard-Knapp wrap-around unit that labels them at the rate of 600 per min—an operation identical to that performed on many canning lines.

Coding Devices

Automatic coding is the sixth change. An electrically heated plate burns the date into the labels as the jars roll off the labeling machine. A rotary coder also applies the date to shipping cases traveling through the automatic carton sealer. Formerly, both coding operations were performed manually. One girl previously had to devote about 3 hr. a day to the job of dating the labels with a perforating unit.

Final change contributing to boost production was the installation of an automatic case packer. With this machine, one girl now packs 10 cases a minute. Before, it took two girls the same time to pack only 5 cases.

This machine assembles a load of 12 jars and packs them into the cells formed by the corrugated partitions within the case. The single line of upright jars from the labeler is first divided into two lines and then into four. When four rows of three jars reach the casing machine, the 12 jars are automatically dropped into the case.

Other advantages in using the case packer: Labels are no longer scuffed during the operation. And there are no packing errors—12 jars are packed into a case each time.

Considerable emphasis has been placed on sanitation. Equipment and utensils—particularly in the mixing room and the filling-and-capping room—are steamed and washed with germicidal solutions each evening. A consulting sanitary engineer inspects the plant once a month, and he issues a report of his findings to management. Weekly bacteriological examinations of the product are made by a commercial laboratory.

There's also a special eighth factor that should be credited for influencing bigger production—the company's foresighted personnel relations program.

Durkee-Mower pays two-thirds of the cost of Blue Cross and Blue Shield hospital and medical services for all of its employees. The firm also contributes 99 percent of the cost of the employee pension plan. Every worker is given a two-weeks' vacation as well as a substantial Christmas bonus.

End (Resume reading on page 50)

Silicones Speed

—Continued from page 46

one type of package sealer, it acts as a back-up cushion, staying resilient after thousands of sharp blows with a hot sealing and stamping iron.

Another important use for silicones is as electrical insulating materials. Laboratory tests and field experience have proved that silicone ("Class H") insulated motors have at least ten times the life and ten times the wet insulation resistance of ordinary motors. They deliver half again the rated horsepower for their size, and they show remarkable resistance to overloads and overheating. Silicone insulation protects motors against failure during rush seasons, especially where motors are exposed to high ambient temperatures or corrosive atmospheres.

A large sugar refinery silicone-insulated its 20 hp. centrifugal motors operating at 1,160 rpm. and 300 deg. F. These motors were air-cooled, but they had to operate in the presence of moisture and under a starting overload of 600 to 700 percent. With ordinary insulation, these motors lasted from 6 to 8 months. But with silicone insulation, they have lasted 34 months, or almost three years, without a breakdown.

Greases Fill Many Needs

Silicone greases for ball bearings withstand extreme temperatures and corrosive atmospheres. Especially developed for the bearings of silicone-insulated electric motors, these greases perform a variety of small but essential lubricating services in the food industry.

For example, a silicone grease is used to lubricate conveyors carrying food through a quick-freezer. Here, the lubricant is exposed to temperatures as low as −50 deg. F. for as much as 4 hr.

Another silicone grease is used to impregnate the packing glands on agitator shafts of processing kettles operated at 446 deg. F.

Silicone grease is also used to lubricate dollies exposed to steam at 250 deg. F. for over an hour. In one instance, a man was employed full time all season merely to lubricate these dollies. Now they are greased once, at the opening of the season.

Bearings exposed to hot acetic acid fumes from tomatoes, also roller bearings in ovens operating at 450 deg. F. are lubricated with silicone greases.

Silicone products of more highly specialized interest in the food industry include a heat-stable and chemically resistant lubricant for pressure-lubricated valves, diffusion pump fluids for high vacuum distillation, and a non-gumming oil for high temperature baths.

This report has been a round-up of typical applications that demonstrate the adaptability of the silicones to conditions in the food industry. These materials are making a substantial contribution to the major objective—better food at lower cost.

End (Resume reading on page 47)

Wood Floors

—Continued from page 66

obtained in the sugar storage room, where the floor was old and had wide cracks. These cracks gave rise to considerable trouble with dry spillage. After treatment, the cracks and crevices were so well-filled and sealed that spillage is now quickly cleaned up with a push broom or a dry mop.

Although the new strip maple floor in our miscellaneous supplies storage room is punished by heavy traffic of dollies and loaded skids weighing as much as 1,500 lbs., there is no evidence of wear after seven months. Only two coats were applied to that floor.

An extreme test is now being made on the mixing platform, which is under traffic 24 hr. daily. Here, only one coat has been applied, and after seven months it is still in very good condition, in spite of all kinds of dry and wet spillage, plus moisture condensation. Only maintenance required is daily dry sweeping and wet mopping once a week.

Comparable results have also been experienced in the ingredient storage room, where there is spillage of such materials as raisins, citrus fruits, candied orange peel, and the like. Again, daily dry sweeping and weekly wet mopping are practiced, except in case of wet spillages, which requires more frequent wet mopping.

How Gloss Is Restored

In all plant areas, the general practice is daily dry sweeping with a push broom or dry mop, followed with weekly warm water mopping in the work areas. The gloss surface is restored by occasional dry buffing with a disk type floor machine using a No. 2 or No. 3 steel wool pad. When the penetrating seal is properly applied and the floors properly maintained, the seal lasts as long as nine months without requiring a second application.

In some areas where there is severe traffic, such as around the wrapping machines, patching of the surface

Here's Why it Pays You to Read the Advertising

The advertising is a rich source of valuable information. In this magazine it offers you ideas and products that may well apply advantageously to your business.

Every issue is a catalog of goods, materials, and services – quickly available to you – just for the reading.

Leaders in business and industry turn to the advertising because they've discovered it helps them run their businesses more profitably.

When you read all the ads in this magazine, the chances are good that you'll get a lead that will materially help you do a better job. For example, you may find a specific piece of equipment that will be a profitable time-saver. Or a tool that will increase worker efficiency. That's why it pays to read the advertising. It's good business.

McGRAW-HILL
publications

Handle **LARGER** Batches

. . . Discharge

AUTOMATICALLY

Now you can do more mixing in less time—with the Worthington-Ransome Rotating-Tilting Pan-Type Mixer.

The drum is not only motor-*rotated* . . . it's also motor-*tilted*. Push-button tilts drum to any angle while rotating—materials discharge *completely*, with no nuisance of scooping.

Capacities up to 3000 lb. reduce handling and re-handling and increase output.

Widely used for coating, coloring, tumbling, polishing and finishing on candies, gum, drug tablets, etc.—mixing powdered milk, relishes, dry gelatin, etc.

Write for Bulletin R-708 on Worthington-Ransome Mixers, built from designs developed from nearly a century of mixer experience.

WORTHINGTON

WORTHINGTON PUMP AND MACHINERY CORP.
RANSOME INDUSTRIAL MIXER DIVISION
DUNELLEN, NEW JERSEY YR.O.4

coat has been necessary after nine months of use. However, this has been done easily and without any indication of an overlap or a patch outline.

The ease with which the seal and coats are applied and the quickness with which they dry have brought savings in materials used and have cut down time lost through interference with production work. These benefits are in addition to the time and labor saved in cleaning and maintaining the floors.

End (Resume reading on page 67)

Quality Doughnuts

—Continued from page 57

and pliable. Doughs must be sufficiently fermented and proofed to provide enough leavening and gluten maturation for full expansion.

Texture. Only adequately matured doughs yield fine silky texture. Young doughs have small cells with coarse texture. And old doughs contain large cells with ragged texture. Doughs with lower moisture contents also assure finer textures.

Fat absorption. Increased fat absorption principally results from under mixing but also from the following: High moisture content, slack doughs, wet proofing, old or young doughs, overproofing, low frying temperature, deteriorated frying fat, excessive frying time, and rough handling during frying. Dusting flour, which breaks down fat rapidly, is not employed in the Doco process.

Crust Color In manual operations, crust color is often too light because of overfermentation. Or, the crust is too dark due to young doughs.

Collapsing. Principal cause of collapsing is wide temperature differences between doughnut and glaze. Underfrying also causes collapsing. Glaze should be held at 110 to 120 deg. F.

Glaze Stability. Actually, there is no truly stable yeast-raised doughnut glaze. But careful adherence to the following procedure can result in commercially acceptable glazes in all but really hot and humid weather.

1. Pack doughnuts only when they are cooled to room temperature.

2. Package them in a carton box with open slots (this permits evaporation of water from the glaze when the humidity is low enough).

3. In coating the doughnuts, don't spare the glaze—the more the better. Water that dissolves the glaze comes principally from the doughnut and the more glaze, the less trouble from dissolving.

4. Apply hot glaze (110 to 120 deg. F.). This will give a clear glaze and enable more rapid evaporation of water.

5. Reduce the amount of water in the glaze—use as little as necessary to retain smooth flow and clarity (about 17 percent).

Acknowledgment is made to Ben Wilson, Jr., Director of Manufacturing, Doughnut Corp. of America, who generously contributed much of the information in this paper.

End (Resume reading on page 58)

Quick-Frozen Trout

—Continued from page 81

in. and, when eviscerated, weigh about 4 oz. Controlled feeding helps maintain even weight.

For processing, only small lots of about 40 lb. are taken from the water at one time, thus assuring a constant supply of fresh fish for evisceration.

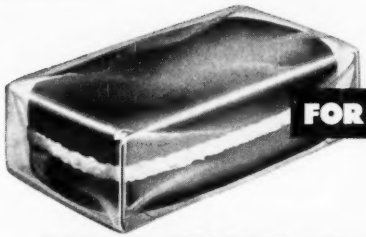
Two methods are used to capture the trout. One utilizes a seining principle. Three men, in bib-type waders, pull nets from one end of a pond to the other. A grader at the trailing end of each net retains only those trout of desired size, allowing the smaller fish to escape back into the pond.

The other method directs the fish into a dead-end flume in which a size-grader is located. This grader occupies the entire width of the flume and is about 12 ft. long. Like the net size-grader, it is comprised of wooden slats. When the end of this grader facing the current is depressed, the smaller trout swim the interstices; when the depressed end is released, the larger ones are caught. Sometimes a hand net is used to seine the fish out of the flume and dump them upon the grader.

Trout of the length required for processing are usually too wide to swim through the interstices of these graders. Fish that are 8 in. or over in length but slender enough to escape through the grader are later seined by hand from their smaller fellows and processed. The smaller fish that escape are recaptured and placed in pools with fish of their approximate age and size to await the time they reach the processing size.

The supply of freshly caught trout is moved in tubs to the evisceration room at predetermined intervals so that a continuous supply is always available. Here, two men eviscerate the fresh fish, each man cleaning an average of four trout a minute. The body cavities of the fish are carefully

LONGER SHELF LIFE



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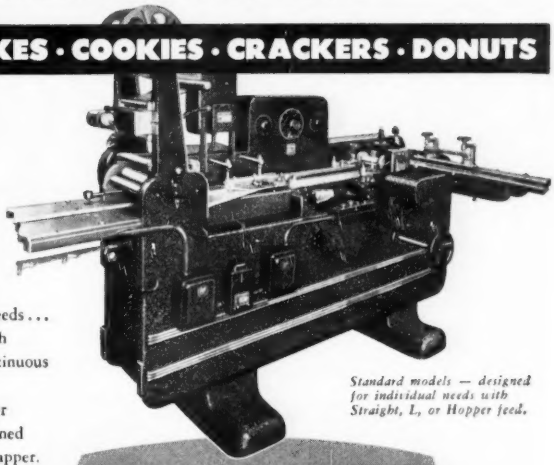
This modern mechanical wizard wraps with "Oven Freshness" and *without breakage* at amazing new speeds... drastically lower costs! Uses materials of all types such as cellophane, glassine, foils, etc., and delivers in continuous feed up to 120 units fully glued or heat sealed — regardless of shape. Only one operator and one helper required. Reduce down-time and eliminate old-fashioned packaging bottlenecks now with the Campbell Wrapper. Write for illustrated brochure and complete details.



Standard models — designed for individual needs with Straight, L, or Hopper feed.

Wraps products of all types and shapes

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...FOR PERFORMANCE UNDER PUNISHMENT

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Wissco Belts are specially engineered for high resistance to abrasion, corrosion and temperature extremes. Their patented mesh construction permits free circulation of air for more uniform heat treatment; provides free drainage for washing, quenching or de-greasing.

Write for booklet describing the adaptability of Wissco Belts.

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A PRODUCT OF WICKWIRE SPENCER STEEL DIVISION OF THE COLORADO FUEL & IRON CORPORATION

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inspected, and washed with cold well water. Cleaned trout are placed in a perforated container to drain. When full, this container is moved to the packaging department.

Here, each fish is first placed in a cellophane sleeve. This is then heat sealed to preserve freshness of the fish, eliminate freezer burn, and retard dehydration. Fish being quite slippery, a special handling device has been found necessary at this point. The opening of the sleeve is placed over the bottom end of a stainless steel chute and the trout is slid into the sleeve from the chute.

After sealing, the wrapped trout are passed to the weighing and packaging department. In packing, an operator selects four trout with a combined weight of 1 lb. and places them in a specially made wax-lined carton. These cartons are run through a wrapping machine, where the final wax wrap, which is also the label, is put on. Cartons are then placed on racks, wheeled into the low-temperature freezing room, and frozen at 40 deg. F. under a wind blast.

Usually, a day's operation completely loads the freezer. The next day, the frozen cartons of fish are cased and stacked in the low-temperature storage room ready for shipment.

End (Resume Reading on page 82)

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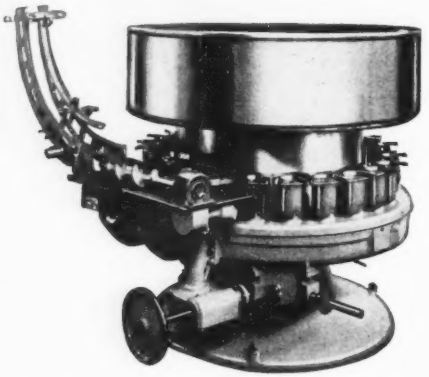
High-Speed Liquid Fillers and Syrupers

Are Doing An Outstanding Job Wherever They Are Installed!



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3. Stainless steel, completely sanitary construction eliminates possibility of metallic or other contamination.

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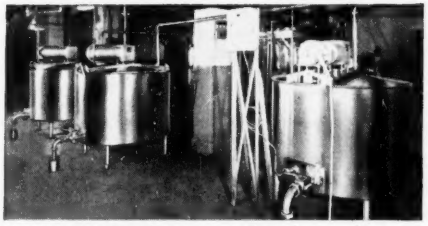
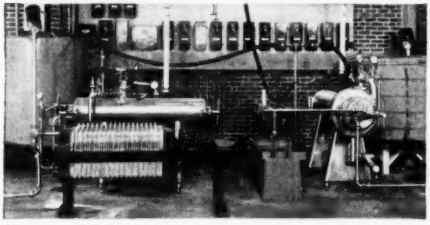


Mojonnier Zone-Control Vats on a baby food application at Beechnut Packing Company, Canajoharie, New York.



Mojonnier Tubular Heaters processing honey and vinegar at I.O.A. Foods Co., Cedar Rapids, Iowa.

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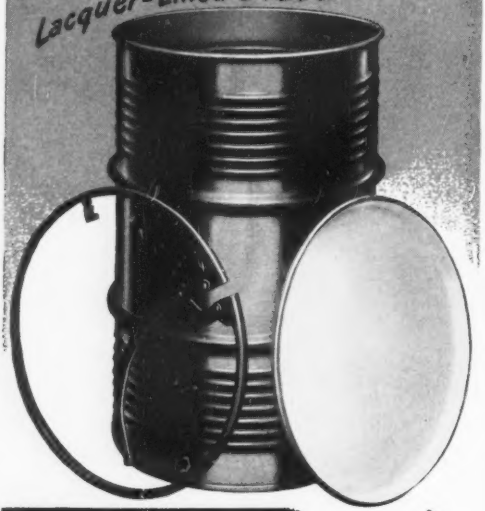

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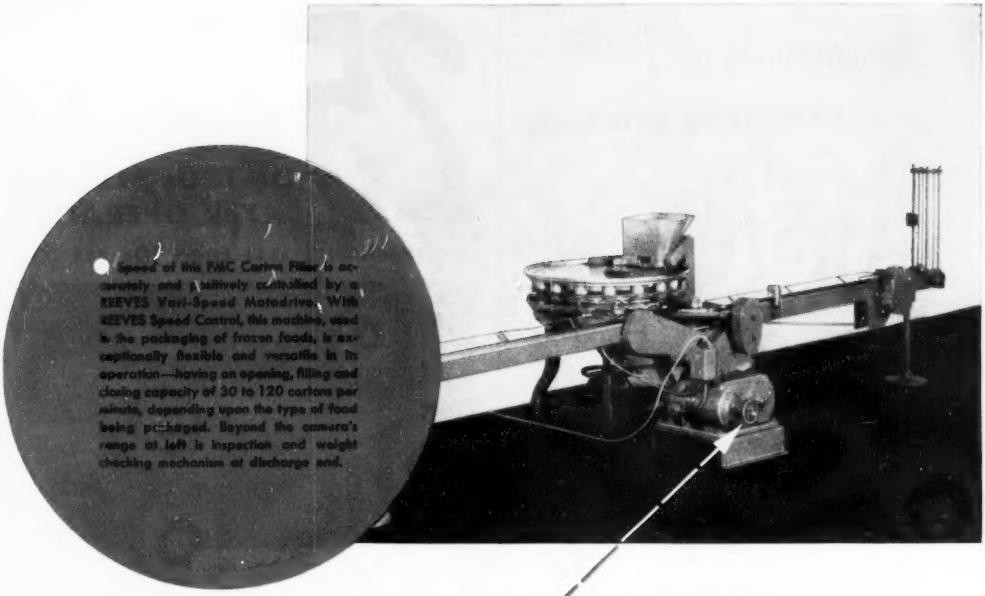

Speed of this FMC Carton Filler is accurately and positively controlled by a REEVES Vari-Speed Motodrive. With REEVES Speed Control, this machine, used in the packaging of frozen foods, is exceptionally flexible and versatile in its operation—having an opening, filling and closing capacity of 30 to 120 cartons per minute, depending upon the type of food being packaged. Beyond the camera's range at left is inspection and weight checking mechanism at discharge end.

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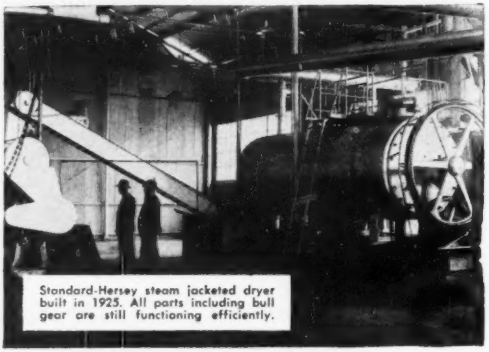

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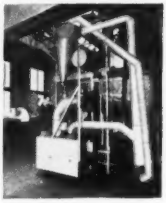

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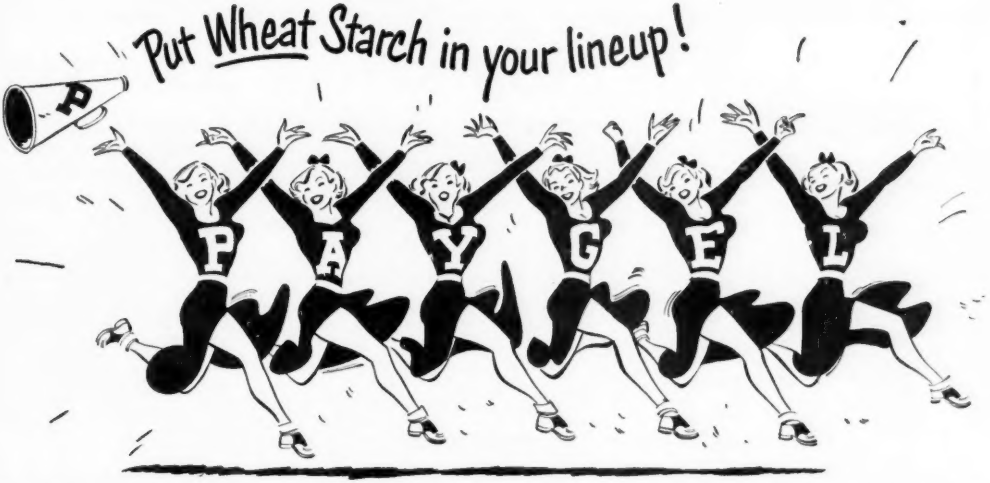

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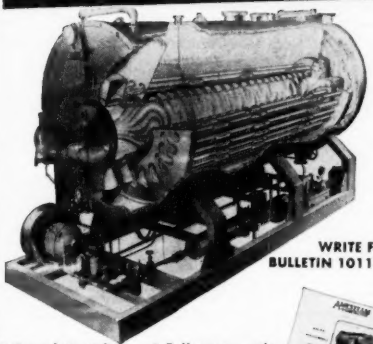

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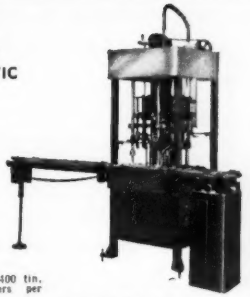

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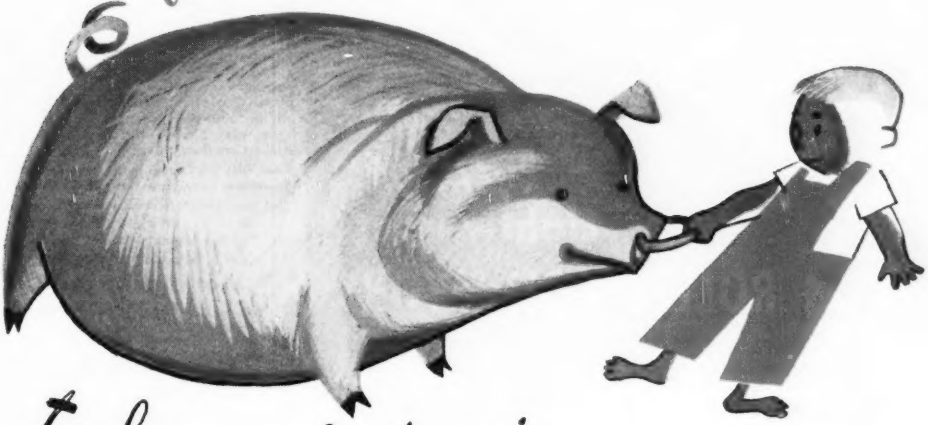

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home again, home again jiggety-jig

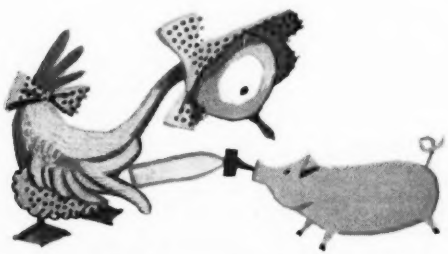
. . . or maybe a juicy steak, leg o' lamb or barbecued chicken. For there is a wide selection of MEAT PRODUCTS in modern markets . . . fresh or frozen, smoked or salted . . . prepared in a dozen different ways, in every kind of package or container.

MEAT PRODUCTS, biggest branch of the food field when measured by total shipment value . . . $9 BILLION annually. A manufacturing giant . . . but actually just part of the greater, integrated $33 BILLION FOOD PROCESSING BUSINESS, whose big ten segments combine to make it America's largest single industry.

And, FOOD is a single sales objective, too . . . one big market for all types of industrial goods and services. For processing problems, though differing in detail, are essentially similar throughout all branches of the field and require the use of like methods, materials and equipment.

FOOD INDUSTRIES serves this broad horizontal market . . . keeps processors alert and informed on other parts of the industry. FOOD INDUSTRIES shows them how they can adapt processes and machinery to their own operation, saving time, increasing profits and improving product quality.

Small wonder that FI is selected by sales-minded advertisers as the best magazine to build recognition for their products in this business. You can boost your own sales too . . . by advertising in FOOD INDUSTRIES, the only paid publication exclusively serving all of the food processing market.



Food Industries

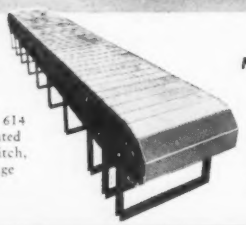
A McGRAW-HILL PUBLICATION

Now . . . for the first time, Steel-Parts—famous for custom-engineered steel belt conveyors—offers the new Steel-Parts METALOK lightweight roller conveyors. These new low cost ball bearing roller conveyors will cut handling costs, speed production because they are *engineered to do your job with maximum efficiency*. Specifications: 1⅜" - 16 gauge, cadmium plated steel rollers; hardened, free-running ball bearings; frames formed of 14 gauge steel; new improved interlocking section connection; adjustable guard rail on outside of curves. Straight or curved sections available in 3 widths, adjustable supports. Get full details on these new Steel-Parts METALOK lightweight Roller Conveyors today. -

FIND OUT WHY more major companies are using Steel-Parts Conveyors—MAIL THIS COUPON NOW!

A few choice territories are still available—write for details.

STEEL-PARTS
Manufacturing Co.
Division of Blackstone Manufacturing Co., Inc.



Model 614 Illustrated (6" pitch, 14 gauge links)

STEEL-PARTS
Makers of America's Most Complete Line of STANDARD AND CUSTOM-BUILT STEEL BELT CONVEYORS

Steel-Parts steel belt conveyors give you a clean, flat, sagless surface of steel . . . easy to clean, economical to use. If you need one conveyor or an entire conveying system — Steel-Parts have just the right unit, *engineered to do your job best.*

Steel-Parts Mfg. Co. (FI12)
4634 W. Harrison St., Chicago, Ill.

☐ Please send me complete information, including engineering data on your new Roller Conveyors.
☐ Send full details and specifications, including engineering data, on your Steel Belt Conveyors.
☐ Have your engineer call to discuss our problems.

Name .....
Firm .....
Address .....
City ..... Zone ..... State .....

SEARCHLIGHT SECTION

EMPLOYMENT • BUSINESS • OPPORTUNITIES • EQUIPMENT—USED or RESALE

UNDISPLAYED RATE:
Not available for equipment advertising
$1.20 a Line—Minimum 4 Lines.
To figure advance payment count 5 average words as a line.
INDIVIDUAL EMPLOYMENT WANTED undisplayed advertising rate is one-half of above rate, payable in advance.
PROPOSALS, $1.20 a line an insertion.

INFORMATION:
BOX NUMBERS count as one additional line.
DISCOUNT OF 10% if full payment is made in advance of four consecutive insertions of undisplayed ads (not including proposals).

DISPLAYED RATE:
The advertising rate is $11.50 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.
AN ADVERTISING INCH is measured ⅞ inch vertically on one column, 3 columns—30 inches—to a page. F.I.

NEW ADVERTISEMENTS received by 10 A. M. January 23rd at the New York Office, 330 W. 42 St., N. Y. 18, N. Y. will appear in the February issue subject to limitations of space available

REPLIES (Box No.) Address to office nearest you
NEW YORK: 330 W. 42nd St. (18)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITIONS VACANT

WANTED: EXPERIENCED man to operate Bliss High Speed Can Body Maker. P-8440, Food Industries.

WANTED: SALES Engineer. Immediate opening for qualified sales engineer to head sales promotion work in food and allied industries, at home office of leading manufacturer of industria linstruments, located in New England. Occasional traveling. Graduate engineer preferred. Permanent position. Salary. A good company to work for. Congenial, cooperative associates. Send full particulars. P-8534, Food Industries.

WANTED: EXPERIENCED working foreman for canned dog food plant. S. E. Mighton Co., Bedford, Ohio.

NEED ASSISTANCE of chemist with knowledge and background of manufacturing essential oils and oleoresins and to help us set up our stills and distillation process. Replies will be held in strictest confidence. P-8408, Food Industries.

POSITIONS VACANT

FOOD TECHNOLOGIST: Quality Control and Process Development laboratory of a major Food Company has a position for graduate Food Technologist with a minimum of two years food experience. Chemical engineering training preferred. Location—New Jersey—Metropolitan area. Please send complete resume. P-8223, Food Industries.

WANTED: EXPERIENCED labeling machine operator for canned dog food plant. S. E. Mighton Co., Bedford, Ohio.

EMPLOYMENT SERVICE

SALARIED PERSONNEL $3,000-$25,000. This confidential service, established 1927, is geared to needs of high grade men who seek a change of connection under conditions assuring, if employed, full protection to present position. Send name and address only for details. Personal consultation invited. Jira Thayer Jennings, Dept. F, 241 Orange St., New Haven, Conn.

POSITIONS WANTED

FOOD CHEMIST, over 20 yrs. experience, preparing and instructing in European style canned food products as pickle, fish, fowl, etc. Will sell own formulae. PW-7332, Food Industries.

FOOD CHEMISTS
JR. AND SENIOR
CHEM. ENG'R. M.S. or Ph.D. $8000
Strong exp. milling industry.
PLANT ENG'R. Maintenance $6500
Candy exp., east.
Call, write or wire:—Gladys Hunting (Consultant)
DRAKE PERSONNEL
7 W. Madison St. Chicago 2, Ill.

POSITIONS WANTED

FOOD TECHNOLOGISTS (2) Female. Experienced canning, tobacco, yeast, flavors, brewery; Control Laboratory? Research? Knowl. Fr., Span., Germ., Norw. PW-8509, Food Industries.

DAIRY TECHNOLOGIST, B.S. large midwestern college. Six years experience of which four have been in a supervisory capacity. Experience covers control of quality and composition in a very large milk bottling plant. In addition have supervised ice cream production in all phases including compounding of formulas. Have also had considerable experience in the manufacture of butter, condensed milks and cultured products. Am capable of setting up and operating a complete control program. Hold New York State Laboratory Supervisor's License. Married, family. Available February. Must locate near large city. PW-8579, Food Industries.

(Continued on the opposite page)

COURSES IN FOOD TECHNOLOGY

a. Mathematics and Chemistry of Food Technology
b. Food Analysis
c. Nutrition
d. Canning
e. Freezing
f. Preserving
g. Inspection and Grading according to USDA standards
h. Mold Counting and Insect Examination

RESTAURANT MANAGEMENT
GENERAL STUDY OF COOKING
PREPARATION OF SALADS
PIE AND PASTRY MAKING
CAKE DECORATING
STUDY OF MEATS

MEN OR WOMEN
VETERANS OR NON-VETERANS
DAY AND NIGHT CLASSES

Highly qualified instructors with practical experience as well as European and American degrees in their respective fields.

ATTENTION EMPLOYERS

If you need qualified personnel, such as: Food Technologists, Laboratory Technicians, Mold Counters, Foremen, Forladies, Graders and other trained personnel for Quality Control Work please contact the Employment Office of the school.

MIAMI SCHOOL FOR FOOD PROCESSING SPECIALISTS

Box 383 CORAL GABLES 34, FLORIDA
Telephone: 83-1301

POSITIONS WANTED
(Continued from opposite page)

MANAGER OR Production Manager. Excess of 25 years successful operation in large scale cannery and for frozen food industry. Experienced all phases of management and production, finance planning, sales, production and organization field to can, experience in all types fruits, vegetables, berries, citrus products and other specialties, and cost conscious. "Can Produce Results". Now employed but seeking change. Answer PW-8581, Food Industries.

CHEMICAL ENGINEER currently employed in production. Background, quality control and development. Diversified products. Age, 30. PW-8421, Food Industries.

FOOD CHEMIST: wants position in production. Experienced supervision and development work. Excellent technical background. Some experience canned specialties, bakers' supplies. PW-8491, Food Industries.

FOOD TECHNOLOGIST-M.Ch.E. (1951). 3 years in bakery supplies and confectionery products. Desires development or production position in allied field. Married, 28, veteran. N. Y. C. or vicinity. PW-8583, Food Industries

WANTED

ANYTHING within reason that is wanted in the field served by Food Industries can be quickly located through bringing to the attention of thousands of men whose interest is assured because this is the business paper they read.

Well established progressive manufacturer serving every branch of the Food and Beverage Industry seeks additional lines for manufacture or exclusive distribution in the growing CANADIAN MARKET.
Adequate plant facilities available. Consumer food products also of interest.
CW-8198, Food Industries
330 W. 42nd St., New York 18, N. Y.

WANTED

Large engineering firm wishes to acquire several complete food plants through purchase of (1) capital stock, (2) assets, (3) machinery and equipment, whole or in part. Personnel retained where possible; strictest confidence.

Box 1219, 1474 Broadway, N. Y. 18, N. Y.

"Opportunity" Advertising:
Think
"SEARCHLIGHT"
First

FOR YOUR PROTECTION
Buy From A Reputable Dealer

SPECIAL ITEMS AVAILABLE

1—Tolhurst S.S. 48" Sus. Style Centrifuge —Perf. Basket.
1—ATM. 26" S.S. Sus. Style Centrifuge, Solid Basket.
4—Stainless Steel Coils 2" dia. up to 147 Sq. Ft. Surface.
2—Stainless Steel Condensers 50 & 65 Sq. Ft. Tubular.
3—W. & P. Stainless Steel 100 gal. Double Arm Mixers.
8—S.S. Tanks 100 to 6,000 gallons.
1—Bullovak Nickel Clad Cast Iron Reactor 150 gals.
8—Dry Powder Mixers 100# to 6000# cap., some jacketed.
1—Stokes "R" Single Punch Tablet Press.
4—Gas Fired M-K-O Boilers 2-10 H.P. 100 and 150#.

Hundreds More Items

Send for Bulletin A-26

We Buy Single Items to Complete Plants

The Machinery and Equipment Corp.
533 West Broadway
New York 12, N. Y. GRamercy 5-6680

GOOD USED EQUIPMENT
AT LESS THAN YOU EXPECT TO PAY

2 Pfaudler Lab. Glass Reactors, 10 Gal. Wking., Jktd. & Agtd., with motor
Mirko 4TH Pulverizer, 50 HP AC motor
Pneumatic Scale & Capem Cappers, 1, 3 & 4 head
Stokes & Smith Vacuum Powder Fillers
Late Model Pfaudler Steam Peeler
2 Schriver Filter Presses, Iron, 12" having 32 chambers & 24" with 13 chambers
2 Transwrap Machines, Model AA & A
Patterson 6' x 6' Nickel Reactor, Jktd. & Agtd., with 5 HP motor, ASME code
Automatic World Twin Turret Labeler, late model
S.S. Piston Fillers—all sizes & makes
S.S. Tanks & Kettles, all sizes
Pneumatic Scale Automatic Duplex Labeler, Front & Back, with 1 HP Exp. motor.

For BETTER BUYS and SERVICE
Phone SOuth 8-4451 - 9264 - 8782
You can BANK on the

EQUIPMENT CLEARING HOUSE, INC.
289-10th ST., BKLYN 15, N. Y.

FOR SALE
2—Heaters, S.S. Tubes, 55 & 65 sq. ft.
9.9 H.P. Kewanee Scotch Marine Boilers.
100 gal. S.S. Clad Jkt. Kettles, 30"x52".
100 to 500 gal. S.S. Mix Tanks, water jkt.
500 gal. Pfaudler S.S. Tank, water jkt., with revolving S.S. Coil.
350 gal. S.S. Tank, 54"x36" with coil.
2—Stainless Steel Coils, 3", 8 turns.
Premier Colloid (Paste) Mill, 7½ H.P.
75 to 1500 gal. Homogenizers or Viscolizers.
36" Rogers Copper Vacuum Pan.
26" to 72" Stainless Steel Vacuum Pans.
Size B3 Leiman Vacuum Pumps, 12.7 C.F.M.
Model 148C Stokes High Vacuum Pump, 1½ H.P.
Elwell Parker Skid Lift Trucks, 4000 lbs.
50 ft. 2"x10" Roller Gravity Conveyor.
28"x60" to 42"x120" Double Drum Dryers.
Hobart Grinder, 1½ H.P.
Send us your inquiries
LESTER KEHOE MACHINERY CORP.
1 East 42nd Street, New York 17, N. Y.
Murray Hill 2-4616

Baker Perkins #17 Oven

Double Radiator, Multicycle Diathermic Heated, Gas Fired with 2 Sets of Trays—*Completely Automatic—Condition like new.*

FS-8026, Food Industries
330 W. 42nd St., New York 18, N. Y.

AS FOR THE PAST 35 YEARS
"Consolidated"
EXTENDS

SEASON'S GREETINGS

5—Day #71 Stainless Steel "Roball" Sifters, single deck, 40"x84", m.d. with 2 HP. 3/60/220 volt motors.
4—Double Drum Dryers — 1—B&C 28x60; 1 Buffalo 32x72; 1 B&C 36x81; 1—42x100.
4—Vacuum Pans: 1 Burkhardt 40 gal. Copper; 1—125 gal. Copper; 1 Mojonnier 6'6" Copper; 1 Arnold 6' Stainless; 1—Rogers 3' Stainless.
1—Sparkler 33S7 Stainless Steel Filter, jacketed.
1—30"x30" Aluminum Filter Press; 45 chambers; 1" cake, side feed, open delivery, non-washing. Used on pectin.
2—Stainless Steel Rotary Dryers: 6'x40' Ruggles-Coles, for either hot air or direct heat.
1—Std. Knapp Self-Adjusting #429 auto. top & bottom Gluer-Sealer, with compression unit.
8—Day Powder Mixers, up to 2,000#.
1—Day 1000# All Aluminum jacketed horizontal ribbon Dry Powder Mixer, center discharge.
2—World Rotary Automatic Improved, S, CH, Labelers and 8—semi-automatic Labelers.
6—Pony Labelrite S, 86 ML, 86 MLVA, 86 MX4.
1—2000 gal. Steel, jacketed Kettle, open top, Agitated, 7" dia. x 7'6" deep.
1—Rotary Vacuum Dryer, 5'x33'.
8—Baker Perkins Size 15 Mixers, jacketed, 100 gal.; 1 size 16, 150 gal. unjacketed; 1 size 12, 20 gal. jack., 1 size 11, 9 gal. jack.
1—#12 Sweetland Filter, 4" centers, iron or copper leaves.
1—1200 gal. Aluminum closed jacketed Kettle, 5' dia. x 8'6" deep; also 1—750 gal., 1—500 gal., 1—350 gal. agitated.
2—225 gal. Aluminum open, jacketed Kettles, also 1—150 gal., 40, 80, 60, 40, 20 gal.
20—250 Gal. Copper, jack. Kettles, open top, with stands, 50" dia. x 42" deep.
40—Unused 200 gal. Aluminum Storage Tanks, 30% of new cost.

ONLY A PARTIAL LIST

THE KEY TO SAVING TIME AND MONEY
CONSOLIDATED PRODUCTS COMPANY, INC.
13-17 Park Row New York 7, N. Y.
We buy your idle Machinery

Reliable FMC EQUIPMENT

FILLING EQUIPMENT

15—Vacuum Fillers, rotary and straight line by Kiefer, Pneumatic Scale, FMC, Horix, etc.
12—FMC, Berlin Chapman, Horix., Haller JUICE FILLERS.
4—FMC and Chisholm-Ryder Stainless HAND PACK FILLERS for No. 2's and 10's.
5—M & S 6 pocket Fillers.
12—PISTON TYPE FILLERS from single to 14 pistons by Filler Machine Co., Elgin, and Pfaudler.
25—DRY POWDER FILLERS by Stokes & Smith, Pneumatic Scale, Triangle, National Packaging and others.

LABELING EQUIPMENT

20—World, Ermold, New Jersey semi-automatic LABELERS.
12—Fully automatic Pneumatic SCALE, World, New Jersey and others.
10—CAN LABELERS by Standard Knapp, Burt, Nu-Way, Chisholm-Ryder and others.
6—CAN CASERS state size and pack required.

FOR GOOD USED EQUIPMENT DEPEND UPON THIS NAME

8 ROTEX AND RO-BALL SIFTERS 20" x 48" to 46" x 120"
2 LANGSENKAMP STAINLESS STEEL PULPERS—EZ ADJUST MODELS

DRYERS OF ALL TYPES
Drum Dryers, Apron Type, Steam Tube, Vacuum Drum, Vacuum Chamber Dryer; Roto Louvre Dryers

DOUBLE RIBBON MIXERS
In Stainless and Steel for Powders—Granulars from 200 Lb. to 2,500 Lb. Some with Sifters

PFAUDLER GLASS LINED VACUUM PANS
500 Gal.—2,500 Gal.—1,200 Gal. Stainless Steel Vacuum Pan

Brand New Stainless Kettles Now in Stock . . . Jacketed from 50 Gal. to 500 Gal.

PLANTS FOR SALE
BREWERY — DISTILLERY — WINERY
VEGETABLE PROCESSING PACKING
MEAT AND POULTRY—PACKING
VEGETABLE OIL EXTRACTOR
MACARONI — SPAGHETTI
PEANUT BUTTER — SALAD DRESSING
CITRUS FRUIT PACKING

Complete New Bulletin just off the press. Send for your copy.

The FMC Rental-Purchase Plan permits trying before buying. Send for Details.

FIRST MACHINERY CORP.
157 HUDSON ST. WOrth 4-5900 NEW YORK 13, N. Y.

FOR SALE

4—Selectro Vibrating Screens, 2' x 7', two-deck, enclosed, stainless steel.
2—Sharples Super Centrifuges #16V, Vaportite, stainless contact parts.
6—Filter Presses, P&F, 10" to 30".
1—Sweetland #10 Filter, 47 monel leaves, 2" centers.
6—Powder Mixers, 50#, 100#, 200#, 500#, 800#, 5000#.
2—Hydraulic Fruit Presses, 5000#, 66" x 66" trays.
2—Worthington 6½ x 6 Vacuum Pumps.
8—Ingersoll-Rand Bronze Centrifugal Pumps, #1½-CRVN and #1½ CRNVL—New.
1—Deep Well Pump 150 GPM—325' head. 20 HP motor. NEW.
1—30" dia. Copper Beer Still with condensers, etc.
2—6000 gal. Horiz. Stainless Steel Tanks.
30—7500 gal. & 8250 gal. Horizontal Glass Lined Tanks.
15—Wood Tanks 20,000 to 30,000 gal.
14—Wood Tanks 8,000 to 10,000 gal.
50—Stainless Steel and Stainless Clad Jacketed Kettles: 30, 40, 60, 80, 100, 150 gal.
2—MOJONNIER #90 Auto. Rotary Vacuum Fillers, 14 spout, stainless.
1—INTERNATIONAL Auto. Vacuum Filler, 12 spout stainless steel.
1—Natl. Pack. Mchy. Auto. Powder Filler, 2-spouts in tandem.
1—Filler Mach. Co. 4-Piston Filler. Auto.
2—Triangle G-2-C Elec-Tri-Pak Weighers & Fillers.

PERRY EQUIPMENT CORP.
1511 W. THOMPSON ST. • PHILA. 21, PA.

"BUY BRILL"—BUY THE BEST

1—6' x 50' Rotary Dryer "s" monel lining.
1—6' x 40' Stainless Steel Rotary Dryer.
1—Stokes Vacuum Shelf Dryer 16 shelves.
3—Ross 2-truck Steam Tray Dryers 500 sq. ft.
5—Atmospheric Double Drum Dryers 32" x 52", 32" x 72", 36" x 84", 32" x 100", 42" x 120".
3—Rotary Vac. Dryers 30" x 8', 3' x 15', 5' x 30'.
3—Oliver 3' x 2', 3' x 4', 6' x 8' Rotary Vac. Filters.
1—Swenson 4' x 5' Rotary Vac. Filter.
4—Shriver 30", 24", 18", 12" P&F Filters.
1—Sperry 30" Aluminum P&F Filter Press.
2—212 Sweetland Filters, 72 leaves.
3—AT&M, Tolhurst, Fletcher 48", 32", 26", S.S. Centrifugals.
1—Tolhurst 32", Monel Suspended Centrifugal.
1—Tolhurst 26" Suspended Steel Centrifugal.
5—Rotex Sifters 20" x 48", 40" x 84", 40" x 120".
1—Robinson Sifter 40" x 84" Stainless Steel.
25—Stainless Steel Kettles and Tanks 20 to 500 gal.
3—Mikro Pulverizers #1SH, #2DH.
12—Day, Robinson Powder Mixers, 100 to 5000#.
2—Stokes & Smith Model GI Powder Fillers.
3—6' x 50', 5' x 25' Steam Tube Dryers.
8—Pfaudler 8000-gal. Glass Lined Tanks.
32—Centrifugal Pumps 1" to 10".

Send for Complete Stock List

BRILL EQUIPMENT COMPANY
2401 Third Ave. New York 51, N. Y.
Telephone: Cypress 2-5703

EQUIPMENT
FOR FOOD AND PROCESS INDUSTRIES

1—Shriver 42" x 42" Filter Press, 45 chambers.
1—Shriver 36" x 36" Rubber-Covered Filter Press, 36 chambers.
1—Sperry 36" x 36" Filter Press, 42 Heresite covered plates, recessed type, center feed, open delivery.
30—Glass-Lined Jacketed Reactors 30 gals. to 1700 gals. cap., Pfaudler and Glascote.
1—Pfaudler 250 gals. cap. Aluminum Jacketed Reactor. "Unused".
2—Orville Simpson #41 Rotex Filters.
3—Louisville Rotary Steam Tube Dryers 6' x 50'.
1—Buflovak Chrome-Plated Double Drum Dryers, 32" x 90".
10—Baker Perkins & J. H. Day, Double-Arm Jacketed Mixers, Laboratory to 200 gals. cap.

R. GELB & SONS, INC.
Est. 1886 UNionville 2-4900

FOR SALE

Evaporator: Swenson single effect, 400 sq. ft.
Belt Conveyors: 10", 12", 16", 20", 30", 40".
Powder Mixers: 100 to 2000 lb. capacities.
Tanks: Stainless Steel—various sizes.
Portable Mixers: New—used, various sizes.
Boilers: Gas fired, 3 to 30 hp.
Kettles: Stain. Steel, all sizes, new and used.
Hammer Mills: Prater, Williams, Raymond.
Powder Fillers: Stokes & Smith, Stokes, Triangle, Gump, McMinn, Howes, Day.
Filter Presses: 10", 18", 24", 32" C.I., 12" alum.
Fillers: Geyer, Kiefer Visco, M&S., Elgin.
Filler: Mojonnier No. 60 st. steel.
Labelers: New Jersey, World, Knapp, Burt, Ermold.
Dough Mixers: 1-6 bbl., single, double arm.
Cappers: Elgin, U. S., Pomona.
Rotary Grain Presses: Davenport No. 3A.

Send us your idle equipment

LOEB EQUIPMENT SUPPLY CO.
1931 W. North Ave. Chicago 22, Ill.

WHERE TO STORE FROZEN FOODS

QUAKER CITY COLD STORAGE CO
PHILADELPHIA, PA
3 WAREHOUSES
Proper Temperature for Frozen Foods

NEW & REBUILT MACHINERY FOR THE FOOD INDUSTRY
Immediate Delivery

Filling Machine #1 M&S 6 cylinder
Filling Machine #2 M&S 6-Cylinder Heavy Duty Stainless Steel
Unscrambler and Conveyor STYLOMATIC
Stainless Propeller Agitators
Dry Filler—Volumetric—Stuyvesant
Apple Cooker and Conveyor
Fruit Press Heavy Duty Farquhar
Fruit Press—Hand Model
Labeler—KNAPP
Labeler—Spot National
Lightening Packer—J. H. DAY
Potato Peeler BLAKESLEE 50
Screw Lift—HAMMOND
Copper Kettle Jacketed all sizes
PRICES AND DETAILS ON REQUEST OR MAY BE INSPECTED AT

Frederick W. Huber, Inc.
268 West Broadway New York 13, N. Y.
Walker 7-6783

New Advertisements

received by January 23rd will appear in the February issue subject to limitation of space available. Address copy to the

FOOD INDUSTRIES
330 W. 42nd St., New York 18, N. Y.

CHOICE MODERN REBUILT MACHINERY

Specially Priced For Quick Sales

UNION Rebuilt Machinery Established 1912

Day and Robinson 100, 600, 1000, 2400 lbs. Dry Powder Mixers and Sifters.

Read 600 lb. S.S. Dry Powder Mixer

Day 20, 40, 80 gal. Change-Can Mixer.

F. J. Stokes, J. H. Day, New Era, Hottman Mixers, from 2 gallons up to 450 gallons, with and without Jackets. Single and Double Arm Agitators.

Baker Perkins BB, JNM & Readco Heavy Duty 50 to 150 gal. Double Arm Jacketed Mixers, Sigma or Fish Tail Blades.

Mikro 4TH, 2TH, 1SH Pulverizers; Jay Bee 3AT, U1, Schutz O'Neill, Stedman Mills.

Schutz O'Neill No. 3 Sifter; Gayco 8 ft. Air Separator.

Colton, F. J. Stokes Rotary Tablet Machines.

Pony M, ML and MX Labelrites, Ermold and World Semi and Fully Automatic Rotary and Straightaway Labelers.

Pneumatic Scale Auto. Duplex Straight-line Labeler, 120 per min., front and back labels, Flasks and Quarts.

Burt Automatic Wraparound Labeler.

Stokes & Smith G1, G4, HG88 Auger Fillers.

Triangle Package Models, G2C, G2S, A2C, N2CA and A6CA Electri-Pak Fillers.

Triangle SHA Auto. Net Weigher, High Speed adj. Semi-Auto Carton Sealer.

Horix & Elgin Stainless Steel Rotary Filler.

Filler 1, 2, 4 and 8 head Stainless Steel Automatic Piston Fillers, Rising Bed feature and Automatic Feed.

Ayars Rotary Filler #10 Cans, etc.

Stokes 2C and Colton Cream Fillers.

F. J. Stokes #47 hand-operated Cream Filler, #49 Closer and #48 Crimper.

Amsco, Doughboy and Heat Seal-it 15D "Pacer" Auto. Cellophane Bag Sealers.

Ceco Auto. Carton Closing Machine.

Standard Knapp No. 429 Carton Sealer.

Hayssen 3-7, Package Machinery Co. Model FA, DF; Miller & Scandia SFC and SSU1 Automatic Cellophane Wrappers.

J. H. Day 35 and 75 gal. Imperial Double Arm Steam Jacketed Mixers.

Sweetland, Vallez, Sperry, Shriver, Republic, Alsop and Ertel Filter Presses.

Huhn Steam & Gas-fired Rotary Dryers.

Pneumatic high-speed Carton Feeder, Bottom and Top Sealer.

Pneumatic Scale Auto. Tite-Wrapper.

Smith Buffalo 20", 27" & 42" Choppers.

Sterling, Anderson and Urschel Dicers.

THIS IS ONLY A PARTIAL LIST OF EQUIPMENT AVAILABLE

OVER 5000 MACHINES IN STOCK—TELL US YOUR REQUIREMENTS

Union STANDARD EQUIPMENT CO.
318-322 LAFAYETTE ST., NEW YORK 12, N.Y.

Top Prices Paid For Your Surplus Equipment

FOR SALE—MODERN PACKAGING EQUIPMENT

LATE MODEL

PNEUMATIC SCALE CO. 35 Per Minute, **AUTOMATIC CARTONING LINE**
Automatic Feeder, Bottom Sealer, Liner, Filler, Top Sealer & Compression Unit.

PNEUMATIC High Speed Feeder & Bottom Sealer
PNEUMATIC SCALE CO. Medium size, Double Package Makers
PNEUMATIC 20 spout automatic Vacuum Filler
PNEUMATIC SCALE CO. Tightwraps
PNEUMATIC SCALE CO. Wax Inner Liner.
PNEUMATIC 4 Scale Net Weight Filler
PNEUMATIC Automatic 4 Head Capper
PNEUMATIC Single Head Automatic Capper
CAPEM 4 Head Automatic Capper
RESINA Automatic Cappers. 1 and 2 Head
FILLER MACHINE CO. 2 and 4 spout Stainless Steel Piston Fillers
U. S. AUTOMATIC 4 station Model JN Auger Filler
STOKES & SMITH 2 station Bag Inserter
STOKES & SMITH also **BENCO** Bag Closers & Sealers
TRIANGLE 2 station Elec-Tri-Pak Filler Model G2C with feed hopper, stainless steel.
KARL KIEFER Rotary Vacuum Filler, 12 spout stainless steel
PNEUMATIC SCALE CO. Simplex Labeler
PACKOMATIC Cartoning Unit, 8" and 12" sizes. Bottom Sealer, Filler and Top Sealer
STOKES & SMITH Model G Auger Fillers
DRIVER 2 Scale Net Weight Filler
CECO 12" Adjustable Top & Bottom Carton Sealer
STANDARD-KNAPP 429 Top & Bottom Sealer
FRED GOAT Check Weighers
WORLD fully automatic Straightaway Labelers
WORLD Automatic Rotary Labeler
STANDAR-KNAPP, BURT Can Labelers
STANDARD-KNAPP Vertical Labeler
NATIONAL WORLD, ERMOLD Spot Labelers
POWDER MIXERS & SIFTERS 200 to 1000 lbs.
PROCTOR & SCHWARTZ 14 Tray Shelf Dryer
COLTON Tablet Machines, Model 3DT
LEHMAN 12"x24" 3 Roller Granite Mill

WANTED

Single Machine or Entire Plants

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REFINING—PACKAGING—CONVEYING—POWER EQUIPMENT

1—Triple Effect Evaporator 13,000 sq. ft.
1—Triple Effect Evaporator 5,400 sq. ft.
2—8' dia. Copper Vacuum Pans, 1780 sq. ft. each
5—14' dia. copper and cast iron Vacuum Pans, 1000 to 1600 sq. ft. each.
2—11' Calandria Pans, 1300 sq. ft. each.
16—Crystallizers 8' x 18', 6'6" x 30'.
8—Hersey Granulators or Dryers 6' x 26'.
54—40" Centrifugals in batteries.
10—54" Centrifugals.
10—#12 Sweetland Filters.
1—Sperry 24" P&F Filter Press.
7—Tyler Hummer Screens 3' x 5'.
5—Schutz-O'Neil #3 Sugar Pulverizers.
1—Stedman Sugar Pulverizers.
2—Hough HL-A Payloaders, 1 yd.
2—Sinden 30" Sugar Throwers.
3—Pneumatic Scale Packaging Lines for 1, 2 or 5# cartons.
2—Brightwood Box Machines.
1—Merrifold Package Machine for 25#.
2—Mechanical 5 and 10# Paper Pocket Baling Machines with conveyors.
6—Hoepner Duplex Scales 100#.
2—Hoepner 5, 10 and 25# Pocket Baling or Sewing Machines.
4—Union Special Bag Closing Machines.
50—Union Special and Singer Sewing Machines.
50—Belt, Bucket and Slat Conveyors.
30—Ribbon or Screw Conveyors, 12" to 20".
62—Centrifugal Pumps from 1" to 22".
56—Worthington Duplex Steam Pumps 3"x2"x 3", 6"x5¾"x6", 10"x7"x10", up to 34"x26"x72".
8—Steam Driven Vacuum Pumps.
580—Motors, 1/8 HP to 500 HP.
8—600 HP B&W Stirling Boilers 160#.
2—750 HP B&W Stirling Boilers 150#.
1—1000 KW Engine Generator Set.
2—750 KW and 500 KW G.E. Turbo Generator Sets.
1—Westinghouse Steam Turbine 375 HP, 3400 RPM.
3—Ingersoll-Rand Compressors 355, 570, 685 CFM.
25—Steel Tanks from 3000 to 350,000 gal.

Machine Shop — Laboratory — Cafeteria — Office Furniture — Wiring — Belting — Copper Pipe — Instruments, etc.

Full particulars and circulars upon request—Everything priced attractively for quick sale.
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HyR Speed Mill—SS—10 HP $1400
Girton Moisture Weigher W/San. pump.$350
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Standard Knapp Straight Line Labeler $400

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FOR SALE

Bausman Disc Refiner for Chocolate with two 300 lb. mixing kettles
80 qt. 3 speed Read Vertical Mixer
Enterprise Grinder with 8-5/8" dia. plates
Burns Peanut Roasters and Blanchers
40 and 50 gallon Copper Jacketed Mixing Kettles
225 gallon Copper Steam Jacketed Kettles
24" Baker-Perkins Chocolate Enrober

SAVAGE BROS. CO.
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Put more opportunity into your company's future

WITH THIS FIVE-STEP PROGRAM

Here's an easy-to-follow program that will substantially increase your company's chances for a prosperous future.

Nation-wide experience in 20,000 companies proves that this popular program also pays off handsomely *today*. It increases each participating employee's peace of mind—making him a more contented, more productive worker. It reduces absenteeism, lowers accident rates, increases output, and improves employee-employer relations!

This program is simply a proved formula for building membership in the Payroll Savings Plan—the "automatic" system by which millions of workers are investing in U. S. Savings Bonds every pay-day.

What Are the Five Steps?

The benefits of the Payroll Savings Plan to your company are in proportion to the percentage of employees who participate. Nation-wide experience indicates that 50% of your employees can be persuaded to join *without high-pressure selling*. Here are five steps which have proved to be the "magic formula" for putting over the Plan. They will get results for you:

1. See that a top management man sponsors the Plan.

2. Secure the help of the employee organizations in promoting it.

3. Adequately use posters and leaflets and run stories and editorials in company publications to inform employees of the Plan's benefits to them.

4. Make a person-to-person canvass, once a year, to sign up participants.

These first four steps should win you 40-60% participation. Normal employee turnover necessitates one more step:

5. Urge each new employee, at the time he is hired, to sign up.

Check up on the Payroll Savings Plan in your company. If fewer than half of your employees are participating, you have a lot to gain by following the five-step program outlined here. All the help you need is available from your State Director, U. S. Treasury Department, Savings Bond Division. While it's on your mind, why not call him right now? Or write the Treasury Department, Washington 25, D. C.

Are You With It?

In the current national Savings Bonds campaign, May 16-June 30, the Treasury Department asks each company operating the Payroll Savings Plan to canvass all employees, with the goal of having at least half of them signed up by the end of the month. This advertisement tells how you can achieve that goal most easily.

The Treasury Department acknowledges with appreciation the publication of this message by

McGRAW-HILL PUBLICATIONS

This is an official U. S. Treasury advertisement prepared under the auspices of the Treasury Department and The Advertising Council.

Sandvik Steel
Belt Conveyor for
Meat Packing
A Sandvik conveyor has special ability to HANDLE MATERIALS THAT ARE...
STICKY
CORROSIVE
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SANITARY (Food)
A Sandvik conveyor's extra ability to handle difficult materials comes from its solid steel belt.
Here are some Sandvik advantages that cut handling costs.
• Long service life
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• Scraper blade can be applied directly for discharging or cleaning
Our engineering staff will design a complete unit to fit your job. Belts of carbon or stainless steel . . . any length and a wide range of widths. Special waterbed arrangement can be provided for cooling of materials.
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Manufacturers of Steel-Belt Conveyors For Over 30 Years
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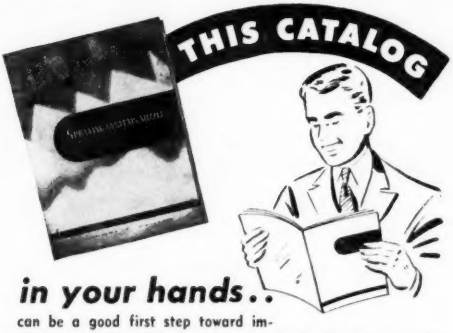
CONVEYORS
SS-66



can be a good first step toward improving spraying operations in your plant. See for yourself how Spraying Systems' specialized experience in spray nozzle design and manufacture can work for you.

Get the EXACT spray nozzle type and size to fit your need.

WRITE for Catalog 22 . . . General Catalog
Catalog 23 . . . Pneumatic Atomizing Nozzle

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3212 RANDOLPH STREET BELLWOOD, ILLINOIS

ADVERTISERS' INDEX

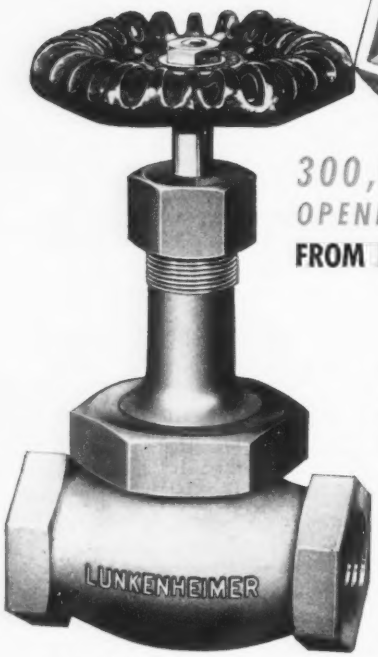
Please turn to the front of the magazine, pages 2, and 3, for the Advertisers' Index.

In order to provide a more complete Readers' Service and to make this service as convenient as possible, the Advertisers' Index and a listing of Editorial Items are combined in the Readers' Service Section in the front of the magazine.

We believe you will approve this change as it serves to prominently list your products and to make it easy for interested readers to request additional information on them.

ADVERTISERS' INDEX
now in the *front* of the magazine, pages 2 and 3

amazing
bronze stem gives
years of extra service



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300,000
OPENINGS AND CLOSINGS
FROM **LUNKENHEIMER'S**

Miracle Metal

Unbelievable? Perhaps, but Lunkenheimer's amazing new bronze stem metal has actually been tested at more than 300,000 openings and closings—the equivalent of years and years of rigorous service. Wear-test machines, carefully controlling torque and number of turns, have registered more than 300,000 cycles in the continuing tests—with live steam flowing through the valves. This stem has also been exhaustively tested under severe field conditions. Literally millions of stems have been placed in service, and not one has ever been returned due to wear failure. The remarkable stem metal, which has revolutionized all prior conceptions of valve stem life, is called Stemalloy*. It is a special-purpose bronze developed exclusively by Lunkenheimer, and is not commercially available. *Only Lunkenheimer valves* have the Stemalloy* stems. Ask your leading industrial distributor for information on the *complete* Lunkenheimer bronze valve line, or write The Lunkenheimer Co., Box 360Q, Cincinnati 14, Ohio.

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Gaylord makes paper bags and sacks of every description: for department stores, drug stores, super markets, clothing stores, liquor stores, and many others — all have found they can depend upon Gaylord to produce bags to fit their exact requirements.

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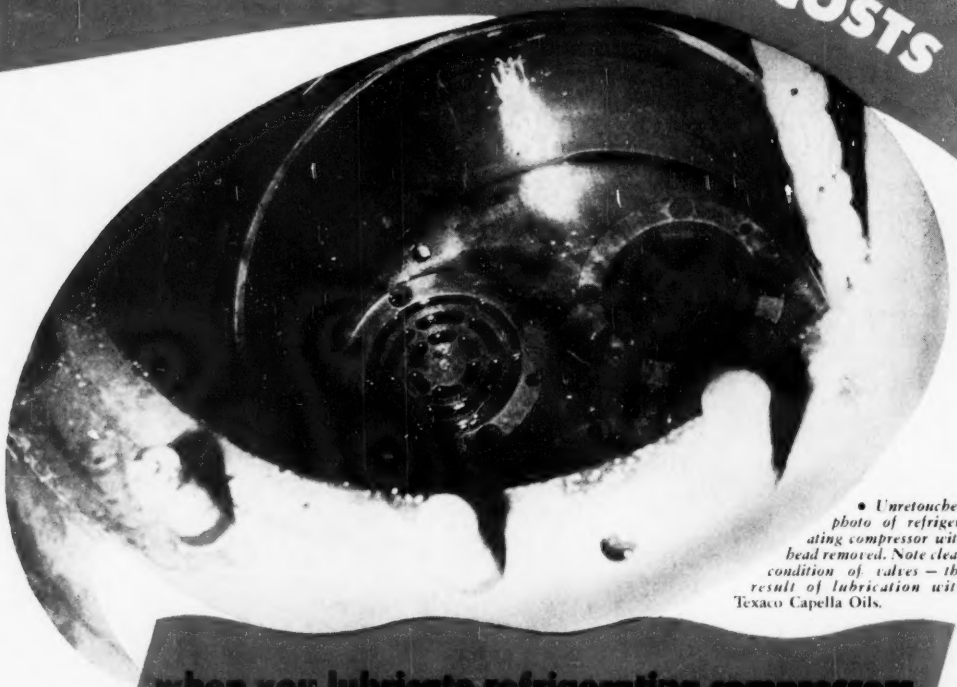

• *Unretouched photo of refrigerating compressor with head removed. Note clean condition of valves — the result of lubrication with* Texaco Capella Oils.

when you lubricate refrigerating compressors with TEXACO CAPELLA OILS

When you pull the head of a compressor that has been lubricated with *Texaco Capella Oils* and note the clean condition of the valves, the absence of carbon, gum and sludge formations, you'll know why *Texaco Capella Oils* keep refrigeration output high and maintenance costs low.

Texaco Capella Oils assure clean compressors and systems. They are highly refined oils with high resistance to oxidation and high stability. In addition, they have very low pour tests, freedom from moisture, and do not react with refrigerants.

There are *Texaco Capella Oils* in suitable viscosities to assure peak performance from your compressors. A Texaco Lubrication Engineer will gladly help you select the proper ones.

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The Texas Company, 135 East 42nd Street, New York 17, N. Y.

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